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THE ROLE OF PUBLIC AGENCIES IN THE INTERNAL READJUSTMENTS OF THE FARM[1]

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The troubles of our agriculture in the last ten years have been much more largely due to maladjusted production than to anything else. To be sure, our marketing system, never a well coordinated smoothly running machine at any time, jerked and jogged in its very worst way under the unusual strains to which it was subjected; and our credit mechanism was not engineered in the forehanded manner demanded by such occasions; and railway rates and tax rates lagged behind prices of farm products and then soared aloft just at the time that prices of farm products started volplaning to earth. But even if all these troubles and mistakes could have been avoided, we would still have had, in 1921 and after, unbearably low prices for wheat, corn, oats, livestock, and livestock products. The plain facts are that our agriculture was over-expanded, that not in the United States nor abroad were there consumers enough with purchasing power enough to absorb the food and clothing products of our farms and of those of the rest of the world; and under such circumstances the prices of farm products could not possibly have been other than low relative to other prices. Not only was agriculture in general over-expanded, but it was especially over-expanded in certain lines of production, particularly in wheat and other cereals, which

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caused unusual distress in certain regions, such as the Northwest. In the older regions, farming had been intensified, especially in terms of equipment. Also more intensive crops had been substituted for less intensive; in the Northwest, for example, corn for small grain and pasture, and wheat, oats, and flax for meadow and pasture. Worst of all, crop growing had been pushed further out onto lands prevailingly submarginal in the present balance of population and food supply; and out beyond the margin of possible crop growing, the ranges had been over-stocked with cattle.

Our agricultural leaders generally understood at the time that the problem was more largely a problem of maladjusted production than anything else, and did what they could or what seemed best to bring about a readjustment. The United States Department of Agriculture, for example, mobilized its resources and came out with an analysis of the wheat situation and a number of positive recommendations as to readjustments. And a year ago this same public agency gathered together all of its pertinent information over the whole field of agriculture and presented *"The Agricultural Outlook for 1924."* Both of these were departures in the right direction. No doubt they had an important influence, especially where taken up and promulgated by public and other agencies in the various States. It could easily be demonstrated that there has been a considerable readjustment in our agriculture along the lines laid out in these outlook studies.

But it is no less patent that the readjustment is by no means completed. The wheat farmer's problem is far from solved. The fortunate combination of a good crop in the United States and a short crop abroad has lifted him halfway to his feet again, but even next year the combination may be reversed and he may be again down on his knees begging for mercy. The cotton farmer's problem is very far from being solved, even though this year's prices may seem highly satisfactory. The cotton farmer's problem cannot be considered fully solved till farm incomes are somewhere nearly as large in the South as in the North—a large order, no doubt, and involving many other things besides a readjusted production. The livestock farmer at the moment is very certain that his

problem has not been solved. As a matter of fact, it is no doubt nearer solution than that of the wheat farmer. It merely happens that some of the temporary circumstances combine against him rather than for him as in the case of the wheat farmer.

Hence, although our agriculture is distinctly upon the upgrade and much of the needed readjustment has been made, there is still much to be done—and while it is being done there will be weeping and wailing over the countryside. The days of McNary-Haugen and Norris bills or their kind are far from over. These particular measures will probably not be introduced again. But others of their kind will—others perhaps very much like them. Hence agriculture needs a program of readjusted production for 1925—it needs one only a little less than it needed one in 1924. And all public agencies concerned with agricultural production should now be combining their energies in working out such a program and making it as effective as possible in the coming year.

However, it is not the purpose of this paper to deal with the needs of the immediate situation, but rather with the need that we always have with us, in good times as well as in bad, of continuous readjustment to meet the changes in our economic environment. As a matter of fact, most of the trouble our farmers get into in periods of depression such as the present are due to the neglected or faulty readjustments of the preceding period. If we could have got our agricultural production properly adjusted by 1910 and then kept it properly adjusted till 1918, the actual distress of our farmers from 1921 to 1924 would in considerable part have been avoided. The war influences upon our agricultural production would still have been there; but we would have turned about-face nearly completely in 1919 and 1920 and would have largely recovered from it long before now instead of being, as we are, only part way through with the readjustment.

This problem of continuous and year-to-year adjustment to meet our changing economic environment is a very large and very difficult one. It is tremendously larger than any problem that has ever been undertaken in disease or pest control or feeding. For the South, it is a larger problem than that of

boll-weevil control and, of course, closely associated with it. For the Northwest, it is a bigger problem than the wheat-rust control, upon which many millions have already been spent. For the Corn Belt, it is a much larger problem than that of a properly balanced swine-fattening ration, upon which any number of feeding experiments are always in progress.

This problem has three aspects. One of these is that of methods of determining what readjustments are needed. This is a research problem. After these methods have been determined, the next step is to set up machinery for the current collecting of necessary information and analysis of the same. Since readjustments are called for currently, data must be assembled and analyzed currently. The third step is the actual getting of farmers to make the needed readjustments after they have been determined—the extension aspect of it. No doubt this third is in many respects the biggest undertaking of the three.

Something has, of course, been done with all three aspects of the problem. For some time we have had machinery of a sort for assembling and analyzing current data. And we surely have done a good deal of research work of a kind on the first phase of the problem. But no one of these phases is being adequately handled at the present time. No one is being a half or even a quarter adequately handled, taking the nation as a whole. In spite of the considerable work already done on the first phase of it, that of methods of determining what readjustments are needed, we are more sorely beset here than anywhere else. The plain facts of the matter are that we have no clearly-worked-out satisfactory procedure for determining what readjustments are needed from time to time. And until such a procedure is developed, we cannot tell what machinery will be needed for assembling the data, or what data to assemble.

I

One would expect, of course, different schools of thought with respect to the proper way to attack this problem. With a view to determining prevailing opinion of the subject, I

wrote a letter to each agricultural college president or dean, and to each commissioner of agriculture, in the United States, asking them to outline what they have done to influence the internal adjustments of their farms in the past five years, and what success they had had with it. When I closed the polls to prepare this paper a week ago, all but five of the agricultural colleges had made some kind of an answer and over half of the commissioners of agriculture. These replies develop two lines of thinking with respect to the problem, which I shall call, for old time's sake, the *laissez faire* point of view, and the *mercantilistic* point of view. I shall develop these two points of view by first presenting them in their more extreme forms. Let me quote the following examples of the extreme laissez faire point of view:

"This year we have been giving considerable effort to the disseminating of economic information with the idea in mind that farmers can make their own interpretations and adjust themselves to changing situations. * * * It seems to me that the chief contribution of public agencies is in education and in preserving freedom of movement."

"The only program which we have is for definite education in the principles involved, leaving the farmer to apply these principles as they fit his situation. * * * We do, however, give a very large amount of attention to teaching concerning prices and the probable future of the economic situation."

One of the commissioners of agriculture furnished a political version of the same point of view in the following statement:

"I believe that many of the educational campaigns at State and Federal expense accomplish very little, and benefit few people, except those on the payroll. In my judgment, the farmers will have to work out their own salvation, and about all that public agencies can do would be to see that they are not unjustly taxed, that freight rates are reasonable and fair, and that speculators in farm products are not allowed to control the markets."

The most extreme expressions to be found today of the mercantilistic point of view are not in these letters, but in some of the bills that have recently been introduced into Congress. Sen-

ate bill No. 2844, the Curtis-Aswell Bill, gives an "Interstate Marketing Association" power "to advise its member associations as to the diversification of production of agricultural commodities and as to the increase or decrease of production necessary to provide an adequate supply of the commodity without causing either an undue surplus or shortage of production." Senate bill No. 3327 (Smith) makes an identical provision. The Capper-Williams bill, which is also receiving much attention these days (H. R. No. 8679), does not call for actual recommended acreages, but it does all but this.

The most extreme expression which the mercantilistic point of view has among the agricultural colleges is in the so-called state, county, and community agricultural programs. Eleven out of the forty-one which answered my inquiry actually have some sort of state program. That the practice is growing is indicated by the fact nine more either are preparing such programs, or hope to get started on one very soon. The following excerpt from one letter expresses the point of view of some of these eight:

> "We do not as yet have a state program, though I think I can honestly state that we will have within the near future. The reason I think I can state this with confidence is that we have placed at the top of our research program here the project of making a definite study to ascertain the needs of just such a program. Second, the president of the institution is sure we should have it. Third, the county agents' meeting in January is going to definitely discuss it; and fourth, some of us have talked of nothing else for the last four years."

The ten state programs vary a great deal in origin and purpose. Some have been developed entirely on the agricultural college campuses. Most of them, however, represent the joint effort of agricultural college workers, state departments of agriculture, farm organizations, and in some cases chambers of commerce, editors of farm journals, and the like in addition. Some of them are comprehensive programs covering all phases of agriculture, including the farm home as well as the farm; others are restricted programs covering one or two things. Some of them are so general in their statements that they will serve with only slight changes for the next fifty years; others

consist mostly of specific recommendations as to what to do next year. The most complete of these state programs are those of Oregon and Colorado.

Six of these ten states also attempt to reduce their state program to a county basis, believing that only when it is reduced to terms of conditions in restricted areas can it safely be followed. Oregon has already reduced its state program to a county basis for nine counties and expects to have the task completed for ten more within a few months. Two states have only county programs, believing that conditions are so varied in these states that it is impossible to work out a state-wide program. One state has wisely decided to work out its program upon a regional rather than upon a county basis. The little state of Delaware finds its farming varying so much that only the community will serve as a unit for programs. The surveys of the type of the Altoona survey, now being made by the United States Department of Agriculture and by several states, are of the community type.[2]

In several states, the departments of agricultural economics or farm management have taken it upon themselves largely to decide what their states need and have used their farm demonstrators to put their program into effect. While these are not programs in the sense that they have been officially adopted by some one or more institutions, they may be more pointed in their effects than the official programs.

Only nine of the forty states replying to the inquiry can be definitely classified as not subscribing in considerable measure to the program idea. Several of these besides the two already quoted went out of their way to explain why they are opposed to the idea. In general, their theory is that each individual farmer should be taught to keep a record of his own business, also how to analyze these records and how to interpret data on prices and production and consumption, and from these work out an individual program each year for his particular farm. The job of the extension forces is principally to get as many farmers as possible to keep the

[2] Mention should also be made of the annual extension workers' programs developed in a number of states. These are mostly simply programs of work for the extension forces, but the projects selected for the year are likly to be based in part upon the special needs of agriculture for the year, so that they may in effect be highly-pointed state programs.

necessary farm records and then help them to analyze them where possible. The price and production data needed are available to the farmers in newspapers, farm journals, and government market reports. But it may be advisable in some cases to assemble such of these data as particularly apply and to arrange them in convenient form and distribute them to the farmers.

The theory of the program-makers, in contrast to the foregoing, is that only a few of the farmers will collect the necessary data or, having collected it, will be able to make a proper analysis of it and of the data on prices and production and consumption, and that therefore some one must come along and collect and analyze these data for them and, on the basis of this analysis, determine what individual farmers should do next year. But since they cannot possibly do it for each individual farmer in the state, they must be content with doing it in a general way for all of them or, better still, for all of them in one region or county or community. To be sure, a general program cannot be made to fit every farm even in one community; but if it is carefully made, and more carefully stated, it will lead very few astray and will lead very many in the right direction.[3]

II.

Before proceeding farther with a discussion of ways and means, we need to analyze a little further our problem of maladjustments in production. These maladjustments may be put roughly into four categories, as follows:

I. Wrong choice or balance of enterprises.

II. Wrong combination of the cost-factors—the "qualitative aspects."

III. Wrong methods and practices.

IV. Mistakes on the margin—in land-utilization.

[3]As for the commissioners of agriculture, most of them disclaimed all connection with the problem of the internal readjustment of the farm, saying that their work was largely regulatory. A few, however, had cooperated in working up state programs, and several others spoke approvingly of the plan. The following is a characteristic statement from such letters: "I feel that some such program is very worth while in coordinating the activities of the various state agencies, although thus far no such action has been taken in this state." Also the following: "The rapidly changing conditions in farming during the last five years make it imperative that all forces in the state join hands in saving agriculture."

The first of these includes such maladjustments as growing timothy in place of alfalfa, growing too much cotton and not enough corn, or too much wheat and not enough forage, or too much small grain and not enough livestock. That maladjustments of this kind are common need not be demonstrated. Just take a typical township almost anywhere and note the variations from farm to farm in choice of enterprises and particularly in the proportions of enterprises. Then explain all of the variations you can on the basis of differences in the land in the farms, differences in labor available, differences in distance to market, and differences in the particular capacities and efficiencies of the farmers. You will generally find when you are through that there is a considerable residue of variations left. Some of these combinations are probably good ones; if so, all the rest must be more or less bad.

The second of these includes such maladjustments as using too little or too much fertilizer, cultivating the corn too few or too many times and thus using too little or too much man-labor and horse-labor, using too small or too large machinery and thus securing a poor combination of man-labor and horse-labor, feeding at too slow or too rapid a rate, feeding an uneconomical "balanced" ration—all of them maladjustments which may be summed up under the single head of failure to produce at the "least-cost combination," or, to be more exact, at the "highest-profit" combination. That maladjustments of this kind are constantly occurring also needs no demonstration. Every farm cost study ever made has shown a wide range in the physical inputs of all the cost factors. For example, the sixty-five herds of cattle reported in U. S. D. A. Bulletin No. 1277 were fed all the way from 5 to 30 pounds of grain per day, and were kept on feed all the way from 60 to 300 days.

The third classification includes a wide assortment of details of method and practices, such as methods of selecting seed, depth of plowing, date of planting, depth of cultivation, whether to thresh from the stack or from the shock, whether to feed whole or ground feed, whether or not to use self-feeders. Nearly all of these, it is apparent, have their cost aspect and hence, in the last analysis, are problems in least-

cost or highest-profit combination the same as those named in the second group. But for most of them, the practical approach to their solution is, in the first stages at least, over a more direct route. That there are mistakes made in these details of farm practices goes without saying. If different farms follow different practices, some of them must be wrong.

The fourth type of maladjustment, that of mistakes in land-utilization, includes whatever mistakes are made in pushing out upon submarginal land or the contrary of this, also whatever mistakes are made in substituting more intensive for less intensive system of farming or the contrary of this. The problems arising under this head are mostly, it is apparent, included under choice and combination of enterprises and combination of the cost-factors. In other words, the extensive margin is merely another way of looking at the intensive margin and the problem of the intensive margin is merely the problem of choice and combination of enterprises and of cost-factors. However, we have become accustomed to looking at the problem of land-utilization as a distinct problem, and it will be so listed here.

III

These maladjustments may also be classified on the basis of origin. First in order, but not first in importance, are those growing out of the *business cycle*. It is very easy to exaggerate the connection between agriculture and the business cycle. Prices of some farm products seem to be very little affected by it. It seems clear, however, that agriculture takes a part, although perhaps a minor one, in the general business expansion of the up-grade of the business cycle, and in consequence of this suffers somewhat more than it otherwise would in the depression that follows. A more serious consequence is that with agriculture continuing its output at a somewhat expanded rate and factory output greatly curtailed as it is during such periods, the purchasing power of farm products is reduced. This condition has been very much in evidence during the present depression, but this is more of a post-war than

a business-cycle effect. There was little of it in evidence in the two preceding business depressions but, on the other hand, much of it in evidence in the depression following 1893.

Closely associated with the business cycle phenomena are *general trends in the price level,* such as the downward trend from the Civil War to 1896 and the upward trend from then until 1915. These affect agriculture principally because many farmers are always in debt. In a period of declining prices, land values stand still or even decline, and owners' equities in mortgaged land increase very little. In a period of rising prices, land values may rise as much as 3 to 5 per cent a year, and owners' equities increase tremendously in consequence. At such times, everyone is reaching out for land so as to take advantage of the rise in values. The inevitable result is agricultural expansion.

American agriculture also seems to have some *special trends* of its own. These may be due to our newness and may disappear when our agriculture finally acquires relative stability, but there is some evidence that these trends are world-wide. In the United States the period from 1865 to 1895, which marked the second great opening-up of the prairies, was in general a period of expansion, although it spelled retrogression for Eastern agriculture. To be sure, our cities developed faster than our farms, but only a little faster. Both were developing at a remarkable rate. Since 1895, however, our cities have been increasing much more rapidly than our farms. During the first part of this period, agriculture was nearly stagnant. By 1910, however, a pronounced recovery was under way. To this recovery was presently added the war influence. The early expansion was mostly in the form of intensification in terms of buildings, equipment, and fertilizer; the later expansion took in the extensive margin as well. The problem which is involved here is the problem of the balance between agriculture and the other industries. The balance does not seem to be very well maintained in the United States. It never has been in England and the continent of Europe.

In any one country, the balance seems to be greatly affected

by what is happening to *agriculture in other countries.* English agriculture experienced in full measure the effects of the opening-up of prairies following the Civil War. Our agriculture is now experiencing in full measure the effects of the opening-up of the prairies of Canada, and of the return-to-the-land movement in continental Europe. When the balance is against agriculture in any country, agriculture will find itself over-expanded; when it is toward agriculture, the reverse will be true. Foreign competition is, therefore, an important factor in the balance of industries in any country.

In their final outcome, these various disturbing influences become manifest in terms of *particular farm products.* Any expansion that takes place is likely to affect certain products especially, perhaps wheat, perhaps cotton, perhaps corn, perhaps hogs, perhaps cattle, perhaps dairying, perhaps apples or potatoes or cabbages. A year ago, we thought that it was wheat that was so affected. This year we think it is livestock. Next year we may think it is cotton.

Particular products are of course affected by other disturbances than the general ones above outlined. Some of them seem to have general trends, such as the relative increase in corn and pork prices during the past twenty years—due no doubt to the relatively limited amount of good corn land on the earth. Several of them seem to have their own production cycles—like the more or less authentic corn-and-hog cycle, or apple cycle, and horse cycle. Then there are some influences that are not associated with any cycle. Perhaps Congress passes some sumptuary legislation. Perhaps a political reversal puts a tariff upon wool and sugar, or takes one off. Perhaps the United States Department of Agriculture decides to boost sugar-beet growing, or sunflower-seed growing. Perhaps several land-grant colleges decide to promote poultry farming or dairying all at once. Sometimes it is some change in the technique of production that produces the disturbance—like the substitution of the tractor and automobile for the horse that has recently so seriously upset several well-intentioned forecasts concerning horse prices.

IV.

Now, obviously, if agriculture readjusted itself at once for all these disturbances, no great harm would come to it because of them. But agriculture does not so readjust itself. It does not, partly because it cannot and partly for no reason at all, except that it is agriculture. The reasons why readjustments cannot be made quickly are so obvious that only a few need be mentioned—for example, fixed investments required in buildings, equipment, and livestock; well-established crop rotations; time required to learn new enterprises and new methods; time required to develop new marketing facilities. Probably more important than all these in preventing readjustments, however, is the psychology of the farmer himself—his apathy in some cases, his conceit in other cases, his refractoriness in others, only his enmeshment of habits, customs, and traditions in other cases.

The effect of this is to introduce a considerable lag between the point of incidence of any such disturbing influence and the time of the response to it. The response-time varies greatly according to the system of farming involved, the type of the population, the size of the disturbance, and many other such things. Many cotton farmers could well have made as many as ten or twenty years ago the changes in their systems of farming which they are now making. Farmers in southwestern Minnesota could well have been growing as large an acreage of corn ten years ago as they are growing today. The wheat farmers in the Red River Valley waited altogether too long before starting to grow potatoes. When they finally did start, they found the new freight rates on the long haul to market almost impossibly high.

It might be said by some that the real cause of the farmer's maladjustments is not the disturbances above named, but this lag in readjusting to meet them. In truth, it is a combination of the two. If the aforesaid disturbances were all to cease, the lag would presently be entirely overcome, and everything would then be properly adjusted. But if there were no lag, the disturbances would cause no maladjustments.

Each of these types of disturbances produces in part its

own type of maladjustment. The business-cycle, price-trend, and agricultural-trend disturbances more particularly cause mistakes upon the margin and in the combination of the cost-factors. They cause land to be taken into farms too fast or too slow; they cause more intensive methods of caring for crops or livestock to take the place of more extensive ones either too soon or too late. Agricultural-trend disturbances, trends for particular products, production cycles for particular products, foreign competition, and the various and sundry irregular disturbances above mentioned, are all particular causes at times of maladjustments in the combination of enterprises.

V.

We have now reached the point where we can take up the question of ways and means with some degree of understanding. One method of attack obviously is to *prevent the disturbing influences if possible.* This is probably the most hopeful attack on the business cycle aspects of it. Where this is not possible, the only procedure is to get farmers to readjust to meet them as quickly as it is wise for them to do so. Any attempt to guide readjustments is fraught with grave dangers and difficulties. I therefore wish to be understood very clearly in what I say with respect to it. I wish first of all to lay down several fundamental tenets, as follows:

1. *The individual farmer must be left absolutely free to plant whatever acreage of any crop that he pleases, or keep whatever livestock that he pleases.* There must be nothing resembling public control of acreage. The reason for this is that conditions on individual farms are so varied that no program of control of acreage can arrange as good-fitting combinations of enterprises as the farmers themselves can arrange. But even if this were not true, I would still make the foregoing declaration merely because of my faith that the democratic way works out best in the end.[4]

[4] It may seem strange to some that I feel called upon to lay down such a tenet as this. It would not so seem if you were to sit in the councils of some of the framers of agricultural legislation these days, or in some of the councils of cooperative associations.

2. *The individual farmer, however, is not usually in a position to determine alone by himself what products are best for him to produce, or in what proportions to combine them, or how to combine the cost-factors.* First of all, he does not have the necessary facts. He could, of course, assemble the facts for his own farm by keeping a proper set of records, but he needs many facts besides those available on his own farm. Time was when some men working in this field were wont to affirm that all the facts needed could be obtained by a cost analysis of the data of a single farm or perhaps of a group of similar farms in the same community. The procedure required was very simple, namely, determine cost of production for each enterprise, then compare these costs with the prices received, and thus see which enterprise paid best last year. From this, know which enterprises to expand or contract next year. All this, of course, is ancient history All now recognize that it is prices and costs in the years to come that will determine profits in the years to come, and that therefore farmers must look outside their farms to see what is likely to happen in the years to come to prices of the various competing products, to wages, and to prices of supplies and equipment. Farming plans are in considerable part made several years in advance. Therefore studies need to be made of trends in prices and production and consumption. Trends in foreign countries need to be studied as much as trends at home. Obviously these are things that the individual farmer cannot do. They must be done for him by properly trained specialists. As a matter of fact, relatively few farmers are able to analyze even the data available on their own farms in such a way as to make them tell them their proper story. Specialists are needed for this also. All this has been said with respect to combinations of enterprises. The problem of combination of cost-factors is even more difficult. It does not require looking into foreign fields, but it does require collecting data from many farms or from many experiments.

3. *If the individual farmer is going to be able to readjust his production properly, he must be supplied with exactly the information he needs, all properly analyzed, pre-digested, and*

served in an appetizing manner. This means that in most cases some one else must assemble most of the necessary data about agriculture in his own area as well as in competing regions, about agriculture in general, and business conditions in general; that some one else must analyze these data carefully, fit them all together, and work out a pattern for the future agriculture of his area.

This program amounts to what Mr. M. L. Wilson has pleased to call "forecasting farm management." As I understand Mr. Wilson, he proposes to mark off certain important areas within which systems of farming are nearly uniform, to make an analysis such as I have indicated for each of these areas, and then to say to the farmers in the area: This is what you need to get ready for in this region. This is the program into which you should begin to fit yourself.

In just what form this information should be served up to the farmers in the area, is a matter for discussion. Some of the county programs that have been prepared in several States specify definite acreages of the various crops as goals to be attained. My own judgment is that the recommendations should be rather specific; but not too positive. The way to avoid positiveness is to include with the recommendations a statement of the reasons for them, and as part of this statement, point out all the uncertainties in the situation, such as incomplete supporting data, inaccurate data, uncertain prospective acreages and weather. Although the recommendations should be specific for the region as a whole, they should not be specific for each farm. This leads to the fourth proposition as to programs.

4. *It cannot be too strongly emphasized in all such programs, however, that the recommendations made may not fit any particular farm.* They merely establish a preponderance in favor of this program. They put the burden of proof on the farmer who plans his farm organization otherwise. As a part of such a program, it would be well to show how the recommendations would apply under a half-dozen or a dozen different typical conditions in the area, such as different types of soil or combinations of types of land, different amounts of

family labor, different distances from market, and so forth. Although the recommendations may be for a general reduction in acreage of a certain crop, on some of the farms chosen for illustration an actual increase in acreage of this crop may be indicated. It will be the marginal producers of the crop who will want to do most of the reducing. This phase of the problem is of the very first order of significance.

In connection with this, there could be demonstrated the few simple records each farmer needs to keep for his farm, such as receipts and expenditures, yields of crops, dates of performing major farm operations, and the like.

5. *Likewise, it cannot be too strongly emphasized that most readjustments should proceed slowly.* In the first place all fixed investments must be carefully considered. Secondly, crop rotations must not be broken into too ruthlessly. Third, farmers must adapt themselves and their organization to the change; in many cases, learn some new technique. This applies especially to such changes as from beef cattle to dairying, a change which in my judgment should in nearly all cases be made by the way of the dual-purpose breeds. Fourth, any changes that are made will be more or less in the way of experiments on many farms. Fifth, it is cheaper to grow into changes slowly than to make radical changes. This applies especially to changes in livestock organization.

The amount of the change to be made in any one year will of course depend upon the violence of the adjustment needed and the urgency of the need. A wheat-grower in North Dakota can make sweeping changes with far less disturbance to the organization than a dairy farmer in Wisconsin.

This program, it is apparent, is very different from that sponsored by the farm management men of many states—the plan of having a few score or a few hundred farmers keep record books, and then showing them so far as possible how to use these results in planning for next year. It is somewhat more closely related to the plan of taking more detailed records on a few farms and then using these results over a wide area. In my judgment, it is a better plan than the individual farm record plan. I do not wish to be understood as decrying

the keeping of farm records and accounts. I think farmers should be led to keep such records as rapidly as possible. But I do not expect any great number of them to keep such records in the near future. The need for a better readjustment is so urgent that it cannot wait till the record-book idea is sold to the farmers. Secondly, these records supply only a part of the information needed. Thirdly, relatively few farmers can make a proper analysis even if they have all the data. Lastly, it is possible to reach only a few people at a time with such a program. If a sufficient number of farmers were included to make an appreciable effect on farm organization in any whole state, the cost would be prohibitive.

VI

To develop such a program properly, first of all, a great deal of new research work is needed. For the problem of combination of enterprises, the method outlined in Part III of Minnesota Bulletin No. 205 (Pond and Tapp) seems to me the most hopeful. This may be called the "method of substitution." It consists simply of balancing probable total farm expenditures against total farm receipts with various combinations of enterprises to see which will net the largest income. As outlined in the bulletin, the method is far from complete. The data in the bulletin were collected for another purpose and do not lend themselves any too well to the purpose for which they are here used. What is needed is a number of studies in which data of exactly the kind needed are collected and analyzed and, after that, similar studies for every significant system of farming in every state of the Union. The type of study needed will in most cases not be as detailed as are route studies; or if it is, it will be greatly modified from the prevailing type of cost accounting route study.

Of course the more important types of farming should be analyzed first. These larger studies should be carried on in close cooperation with Mr. Wilson and Mr. Tolley of the United States Bureau of Agricultural Economics. As soon as any system of farming has been studied, the states having

such a system of farming within their borders can begin to make use of the results in regional programs. As more systems are studied in any state, more regional programs can be outlined.

Before such programs can be prepared, an analysis must also have been completed of all the elements external to the farm affecting its future readjustments—an analysis of trends in production and consumption at home and abroad, of business-cycle trends, of trends in price levels and agriculture in general, of trends in wages and other costs. It seems to me that much of such analyses will best be made in many cases by the Division of Prices and Statistics of the Bureau of Agricultural Economics. In the first place, it would be a waste of energy for each state to make some of them. In the second place, few states have the facilities for collecting such data. Thirdly, few indeed have adequate statistical talent on their staffs.

At this point, it may be well to point out the tendency of many people to confuse the research and the extension phases of such problems. It is one thing to use difficult statistical technique in solving a problem; it is entirely another to use simple devices for presenting the results. The conclusions derived from a multiple curvilinear correlation analysis are as easy to state as those from an old-fashioned simple frequency correlation table, and they are much more dependable.

For the problem of the combination of the cost-factors, the method outlined in U. S. D. A. Bulletin No. 1277 (Tolley, Black, and Ezekial) will contribute much. Inasmuch, however, as after all it is the highest-profit combination rather than the least-cost combination in which we are interested, the least-cost analysis does not tell the whole story. It will, to be sure, in many cases come as near to it as one can get for the present. Some promising results have been obtained on highest-profit combination working with survey data from a considerable number of farms and using multiple correlation methods.

The experimental method can also be of considerable use in solving this problem, especially in cases where feed and fertilizer are used. The procedure commonly followed in feed-

ing experiments is the comparing of costs of certain combinations of feeds to see which gives the cheapest gains. Such methods can be applied to all kinds of farm practices, for example, to fertilizer applications, to cultural practices, to harvesting methods and so forth. The difficulty with such experiments as usually conducted is that one does not know when he is through what the least-cost combination is—he merely knows that under the conditions at hand, one was cheaper than the other one, or perhaps than the other two. But this difficulty can be obviated when the experimenters come to understand their problem better, particularly when they come to understand the need of separating the physical from the economic data, in the manner outlined in U. S. D. A. Bulletin No. 1277.[5]

The problem which is here involved is referred to by some as the "qualitative aspect" of agriculture. They look upon it as the problem of *how well* it pays to take care of a given crop—how much feed and how expensive feed to use, how much fertilizer to use, how well to prepare the seedbed. In some sections of the country—for example, in the Cotton Belt—this is probably a more important question than the question of the balance of enterprises.

As for the problem of land utilization, the research methods employed must probably be an adaptation and combination of the two foregoing. The problem is partly one of comparison of enterprises or combinations of enterprises and partly one of intensity in any one crop. The studies will frequently need to cover wide areas because of the limited number of enterprises on one farm.

VII.

The making of the studies above outlined for the four types of maladjustments is only a beginning. Machinery must be set up for collecting and analyzing current data. Combina-

[5] This is an almost virgin field for research. It is only since the summer of 1921 that farm economists have been talking very much about the "least-cost combination" and the "highest-profit combination." Even Bulletin No. 1277 contains no actual usable results. The data were inadequate. A large number of special studies must be made using data especially suited to such a purpose. Such studies will be rather expensive; but they will need to be repeated only at considerable intervals.

tions of enterprises are to be replanned with changing prospects as to costs and prices. Hence data must be collected currently on production, consumption, prices, wages, and other costs. Likewise, new cost-rates are needed for figuring out new least-cost and highest-profit combinations each year, and new cost and income data on the extensive margin. Some of this machinery should be machinery of the United States Bureau of Agricultural Economics; some of it, of the several states. The foreign data should be collected by the Federal Bureau. This is a branch of the work of the Bureau of Agricultural Economics which has recently been somewhat expanded. It needs to be expanded still more. We need to know much more than we do about foreign competition in order to plan our domestic production properly.

As far as the extension aspects of the program are concerned, there is little more to be said. There are many who say that guiding production is a hopeless undertaking, that if you advise the farmers to grow less cotton, some will figure on this fact and grow more and that the final effect will be nil. There is some truth in this. Others say that the farmers pay little attention to such advice. There is also some truth in this. Nevertheless, I do not think we need to conclude on the basis of past experience that no program for influencing internal readjustments will succeed. We really have had no experience with such a program as I have outlined. *"The Agricultural Outlook for 1924"* comes the nearest to what I have in mind, and I think that this had an important influence. It is my faith that the farmers of the country will soon come to use and value information of the sort which I have described, and also that presently they will learn how to use it in the right way.

I believe that most states should eventually have some sort of a state program of readjustment or, better still, a set of regional programs of readjustment. The present programs are to be criticized in some cases for including altogether too much; in my judgment they should be narrowed down to a few recommendations of major importance for the period and a few others applying to next year particularly. These latter should be changed each year. Other programs no doubt in-

clude recommendations that are untimely or unsound. It is best to wait if there is any doubt. One gain from such a program, even for an agricultural college alone, is that it brings the various departments together and makes them agree upon a common program. After such a program is adopted, the wheat man can no longer go out and boost unqualifiedly for wheat, and the sheep man for sheep, and the dairy man for dairying. It does not solve such a situation to include in such a program a boost for nearly everything as some of the state programs are inclined to do.

VIII

We have now come to the point where we can talk about the dangers and difficulties of such a program. They are very real. The principal ones are on the score of the uncertainty of the future. Wars, epidemics, and droughts will upset all calculations. A perfectly good program may seem to go wrong because of a series of late spring or early autumn frosts or big crops. It is also very easy to overlook some of the major factors in a problem. The horse enterprise recommendation is an example of this. Agricultural colleges rather generally hesitate to get behind specific recommendations. It is always easier to sit on the fence and watch. But the time has come in the affairs of agricultural colleges when they can no longer do this and flourish. This statement is even more pertinent for the United States Department of Agriculture. It is time for all concerned to get off and push. But which way will we push? This is really the big question to be solved.

Some of the issues involved in problems of readjustment are far-reaching in their scope. They take in the whole future policy of the nation with respect to agriculture. This is another of the principal reasons why a procedure such as I have outlined is dangerous. Suppose, for example, that those in charge of the United States Department of Agriculture at some future date become obsessed with the notion that the ideal to work toward is national agricultural self-sufficiency—no imports and no exports of farm products. On that basis,

a different program for the future will follow than if the ideal is that of exporting those farm products in which we are most productive, in which we out-produce the world, and importing those at which we are at a disadvantage. I might hint that there are strong leanings toward such a policy of self-sufficiency even in certain nooks and corners of the Bureau of Agricultural Economics today; and for some state institutions, this condition of mind is rampant, particularly state departments of agriculture. For all these reasons, it will be well to go slow with the actual promulgation of programs of readjustment. But the work of assembling the data and making analyses and setting up machinery should begin at once and go full speed ahead. There is no time for delay in this.

Before starting to write this paper, I debated as to whether or not to start in by describing the things the United States Bureau of Agricultural Economics is doing or expecting to do or hoping to do, and then showing you why each of its proposals was worthy of consideration. I decided otherwise, but if I had followed such a plan, I would have come out at nearly the same place. There is very little difference between what I have proposed and what the Bureau is now doing or is getting ready to do. If the Bureau can only have a free hand to develop its present plans, we can expect an aggressive constructive program for the future. For this, we owe much to the vision and understanding of the late Secretary Henry C. Wallace.

In the state colleges the situation is fully as promising so far as point of view and objectives are concerned. From all but a few states came responses indicating a desire to take hold of the problem of the internal readjustments of the farm in a larger way than heretofore—from Missouri, Arkansas, Tennessee, Georgia, and North Carolina in the South; from Maryland and New Jersey in the East; and from Colorado, Oregon, and Montana in the West and North. If only our legislators and deans will get behind and help, we can do much before the next great business depression descends upon us.

RELATION OF COOPERATIVE MARKETING TO THE ADJUSTMENT OF AGRICULTURAL PRODUCTION[1]

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The readjustment following the war period has brought to the front the importance of adjusting the amount and kind of production on the farms to the needs of the market. During this same period, cooperative marketing has experienced a very rapid development, particularly in the establishment of large-scale marketing associations. These enterprises in many instances have been launched in the hope that they would furnish a solution to economic problems of agriculture. This situation has brought us face to face with the question of the extent to which we may expect cooperative effort to be successful in stabilizing production.

A brief statement regarding some organization fundamentals may be appropriate at this point. You are conversant with these fundamentals, and my purpose in making mention of them is that they may supply a background in delving into these questions. Frequent comparison is made between farmers and men in other lines of effort with respect to the extent of organization found among them. The customary purpose of these comparisons is to demonstrate that the tillers of the soil are far behind other interests in the matter of organization. In giving consideration to agricultural difficulties, the popular conclusion to arrive at is that the key to the situation is organization. The line of reasoning is that agriculture is unprofitable because it is unorganized, and that industry is prosperous because it is highly organized. If this conclusion were accurate, the line of action to follow would be self evident. But a person does not have to be a deep thinker or a learned scholar to realize that the explanation of prosperity solely upon the basis of the degree of organization

[1] This paper was read at the Fifteenth Annual Meeting of the American Farm Economic Association, held in Chicago, December 30, 1924.

is a most superficial one. A slight acquaintance with present-day conditions is sufficient to convince anyone that all lines of agriculture are not depressed and that all other lines are not in a high state of prosperity. As industries go, copper and rubber tires do not appear to be lacking in organization, still their situation has not been one for which roseate hues have been appropriate at all times. Certainly the reason that wool has been above pre-war levels while beef cattle have been below is not to be explained by any difference in the extent of organization among the producers of these commodities.

While organization in industry is by no means a negligible factor in bringing about necessary adjustments, there are other distinguishing features between agriculture and other lines of industry. The mistake is frequently made of assuming that a farmers' marketing association is an exact counterpart of a manufacturing concern. One important difference is that the latter has control over the production as well as the marketing of its products while the former merely sells the products turned over to it by its members. Were large-scale corporations adapted for farming, such concerns would be the parallel of the manufacturing company. But agriculture, unlike manufacturing, does not show economies from large-scale operations. It is carried on most advantageously by comparatively small units, namely the individually owned and operated farm. The Dairymen's League Cooperative Association or the Burley Tobacco Growers' Cooperative Association would be the counterpart of the U. S. Steel Corporation or the Ford Motor Company if they produced the milk and the tobacco they sell, or if the latter concerns were broken up into a large number of independent producing units and became merely the sales outlets for these separate units.

Readjustment of production to market requirements may come more quickly in industry than in agriculture because it is forced. The factory depends upon hired labor while the farm utilizes mainly the labor of the operator and his family. An unbalanced market condition which makes the factory unable to meet its expenses forces curtailment or shutdown. The farmer often manages to continue production by accepting a lower return for his labor. Folks talk about farmers strik-

ing just as though a farmer were merely a laborer and not also the operator of the plant for which he works. Where would the farmer be if he went on a strike for sixty days when he attempted to resume production at the end of that period? Add to these differences, the fact that agricultural production is subject to the vagaries of temperature, rainfall, insect and disease pests, and that at planting time the farmers' market is months away, then we clearly see that the adjustment of production to demand cannot be made in agriculture with the same nicety encountered in some other lines. The relationship of cooperative marketing enterprises to production adjustment in the nature of things must be merely one of exercising influence, not control. This influence is exercised not directly upon production itself but indirectly through the individual growers in whose hands the determination of production, to the extent it is determined by human ability, lies.

That this distinction often is not fully appreciated is indicated by the frequent reference to how organization of farmers will place agriculture on the same basis as other industries. For example, a man who is taking a leading part in encouraging the adoption of the cooperative selling idea, in a recent article said among other things "* * * if it were ascertained that we were producing year by year any commodity in excess of the world's needs, and we were organized, we would at once take steps to curtail production, just as every other organized industry does." In the same article he said, "In other words, through organization we would be able to do just what other great organized industries do. We would adjust our production to consumption. I know of no other way in which this can be accomplished." This illustrates the popular conception of production control by farmers' organizations. The basis of these statements evidently is a belief that cooperative marketing possesses the ability to adjust production.

While we are engaged in laying bare the situation as it exists, it seems in order to inject a classification of organizations with respect to the place they occupy in connection with this problem. Local organizations have but little relationship to this question as the sphere within which they exercise their influence is too limited to make them of outstanding import-

ance. A farmers' elevator, a livestock shipping association, or a creamery would have no influence of importance on the volume of production of the commodities they handle. It is not to be gainsaid, however, that such locals may be found to serve as effective contact points for the dissemination of information. Thus, while separate locals will not go far in initiating production readjustments, their influence as distributors of information regarding the advisability of certain adjustments should be kept in mind.

The cooperative marketing associations with which we are primarily concerned in considering production stabilization are the large-scale enterprises. Of these, there are two general types, one the federated type which consists of organizations which are built up with definite local organizations, and the other, the centralized type in which there are no definite locals. The California Fruit Growers' Exchange is a well-known representative of the federated type. The Burley Tobacco Growers' Association is an example of the centralized type. In the former type, the farmer is a member of his local and the locals are members of the central, or may be members of district associations which in turn make up the central. Control over local matters is left with the local body. In the centralized plan, the growers are members of the central association directly, and control over local as well as general questions is lodged in the central office. However, for the particular purpose of this discussion regarding production stabilization, this classification is not nearly as important as is one that is based on the commodity involved.

By what line of reasoning is the conclusion reached that the commodity itself is a determining factor? A consideration of some differences of commodities will suggest the answer. Some products are localized, that is, their production is restricted to a relatively limited area. Raisins are produced in a localized area. The same is true to a considerable extent in the case of prunes, oranges, tobacco, walnuts and cranberries. Market milk, while produced somewhat generally, may be included in this group because of its localization from the market viewpoint. Other products are produced over wide areas. Representative of these are wheat, livestock, cotton, eggs, and

wool. The number of producers involved in localized products is much less than in the case of widely produced commodities. Because of the smaller number of individuals and the smaller area involved, it is much easier to organize a marketing association which will become a dominant factor in the market in the case of a localized commodity than in the case of a widely produced commodity. An organization including a large proportion of the producers is a reality in the case of raisins, prunes, oranges, and burley tobacco. There is no immediate prospect of a marketing organization which will have a majority of the producers of livestock, wool, eggs, or cotton on its membership rolls. The idea of a world organization has been brought forward for commodities such as wheat, but in our present stage of cooperative development it would be a tax on our imagination to picture an association of wheat growers which would include a majority of wheat farmers in this country alone, not to mention Canada, Australia, the Argentine, Russia, India, and other countries. Much has been said about the development of extensive cotton marketing associations, but it is apparent that the greater part of the cotton crop is still being sold through other channels.

For some products, therefore, it is relatively easy to sign up a large proportion of the total production for marketing through a single association. Because of the organization of the trade or because of the character of services to be performed, such a sign-up is imperative at times. Thus, milk producers find it necessary to be well organized in order to deal effectively with the city distributors because the latter are well organized. The outlets for burley tobacco are dominated by a handful of large tobacco manufacturers, and it appears desirable to have a large proportion of the growers in the organization which is to sell to these manufacturers. National advertising of cranberries, oranges, walnuts, and raisins needs the support of a large share of these products to be economical and effective.

Some products have highly-organized market machinery which readily reflects by means of price changes the changes in supply and demand. This is true of wheat. For other products, this is not the case. Market milk and tobacco, for

instance, have no corresponding market organization. The question of perishability also enters into consideration. The marketing of fresh strawberries and peaches is essentially a question of place distribution. Less perishable commodities involve questions of time as well as place distribution.

What has this to do with the stabilization or adjustment of production? The answer is that it has a very close relation to this question as it affects cooperative organizations. An which have existed in the wheat, livestock, and butter markets for its products is compelled to adopt a much more intimate relationship to price determination than organizations which handle world commodities. This does not imply that they have any special control over price. It does mean that there is imposed upon them the burden of determining the prices they will ask for their products. The desire to show the members how capable the organization is, constitutes an almost irresistible temptation to place these prices upon a level which greatly stimulates production and later produces an unwieldy supply which is disposed of only with great difficulty. Associations which handle commodities where the element of majority control does not enter, are by no means free from situations where the supply is too great for the effective demand. Conditions which have existed in the wheat, livestock, and butter markets attest to this fact. Such organizations, however, follow the market and do not establish it. Responsibility for the oversupply cannot be laid at their feet. Organizations of the commodity-controlling type have a greater incentive to regulate production because if they could control production, they would be in velvet.

The organization among the raisin growers of California has furnished an example of this. The raisin industry is concentrated in a small area in the vicinity of Fresno, California, and the association readily secured a sufficient sign-up to make it an important factor in the market. An aggressive advertising and sales campaign enabled it to sell raisins at very attractive prices. The higher price level produced by war conditions also was an aid in bringing about this result. As a consequence, this organization was heralded far and wide as an

example for farmers to copy everywhere. The idea seemed to be prevalent that all the association needed to do was to fix prices at a profitable level. Because it takes some time for vineyards to reach the bearing age, production could not be increased as rapidly as is the case with annual crops, but production steadily increased and eventually reached the point where sufficient added demand could not be brought into the market, even by the skilful advertising and merchandising methods employed, to take care of the increased production. The result was that prices had to be scaled down materially, furnishing conclusive proof that cooperative marketing is not a way of defeating the operations of the forces of supply and demand. Had the raisin association been able to keep production down to the amount the market is willing to absorb at high prices, such prices could have been maintained, but it did not control supply.

With this as a background let us consider some of the possibilities and limitations of production control by organizations. The fundamental principle that the individual farmer is the determinant in matters of acreage has already been pointed out. Mention has also been made of the influence of climatic factors in determining the output of the acreage thus fixed. It must be kept in mind, therefore, that organizations do not have arbitrary control over acreage and any control exercised must be the result of influencing the decisions of the individual by supplying him with information regarding market conditions, stocks on hand and the future outlook. It is sometimes suggested that an organization can accomplish this result by obtaining agreements from their members to restrict their acreage to a certain maximum. No demonstration of such an achievement on anything but an extremely temporary basis has ever been made. Burley tobacco growers did have a "cut-out" in 1908 which was effective in a large measure in curtailing production during that year. The sentiment, however, evidently was not unanimous, and pressure of questionable character was brought to bear upon recalcitrant growers to make the action effective. On numerous instances, meetings of farmers have been held and solemn

resolutions have been passed indicating that reductions would be made and on equally numerous occasions they have been promptly forgotten. In some cases, individual farmers have come from such meetings with the intent in mind of maintaining or actually increasing their production. The farmer profits from outguessing his fellow farmers. If curtailment is to be general, then the individual thinks that it is a good time for him to increase his production to take advantage of the improvement. His conclusion would be all right providing he had a patent on it but too many are likely to discover the same idea. For an organization to hold production in check when profitable prices prevail is a problem because the individual member is in the position of a piece-worker in his relationship to the organization. At a given profitable price, the more he produces the greater his profits are, so he increases production in order to increase his income.

Before entering upon a discussion of organized production adjustment, mention should be made of one or two ways in which the immediate supply at times may be influenced. The point in mind is not adjustment of production but is closely related to it in effect because it involves the supply after production. Grading has some possibilities of this kind. For such products as fruits and vegetables where the grading service involves sorting, organizations may help in overcoming an existing oversupply by sorting more closely, eliminating the more undesirable, thereby reducing somewhat the total supply and aiding in the disposal of the remainder because that will be of higher quality. This is an important possibility in times of temporary oversupply such as was true with Georgia peaches during the past season. It does not, however, strike at the root of the problem of the regulation of supply through the adjustment of production.

For some commodities, the disposal of part of the supply by processing or manufacturing into by-products has some possibilities. In the case of fluid milk, adjustment of the supply is made by the manufacture of surplus milk into butter, cheese, powdered milk, condensed milk, or similar products. Many milk producers' associations have established surplus

plants for this purpose. In the case of berries and the like, organizations having canneries may dispose of products through these when the supplies are too great to be absorbed by the market for the fresh berries. The work of the California Fruit Growers' Exchange in studying and developing by-products is suggestive in this connection. As time goes on, various organizations probably will develop such outlets, particularly as a means of taking care of the inferior grades which are not so easily marketed in their original form.

Another service which is related to this problem is that of demand creation. Many marketing associations have obtained valuable results from their advertising and other efforts to bring new demands into their markets by finding new users and new uses for their products. Through this service, an apparent oversupply has been moved into consumptive channels at favorable prices. The nature of the commodity determines possibilities in this field. A staple such as wheat responds little if at all to advertising while a commodity such as cranberries or oranges shows decided results. Although the elasticity of demand for different commodities varies, the total demand for farm products is relatively inelastic. An individual's capacity for food is definitely limited, and demand creation will tend to produce a readjustment rather than an increase of consumption. If you have baked apples for breakfast you will forego the pleasure of an orange. If the dessert at dinner is raisin pie, you do not also have apple and pumpkin pie.

Mention might also be made of the possibilities of an organization disposing of an oversupply by means of dumping, that is, selling the surplus in foreign markets at whatever prices it will bring in order to take it off the home market. It is probably true that this practice is not nearly as prevalent among manufacturers as commonly believed. It is conceivable that a cooperative organization, as for instance an apple association, might resort to this temporarily as a method of developing new outlets in foreign fields. As a permanent plan, however, it would not be profitable unless a very large proportion of the commodity were controlled by the dumping

organization. The process in order to be effective would need the support of protective duties, and this would meet with strenuous objection from the consumers, who would see in it a scheme for exacting higher prices from them. In so far as agriculture is concerned, reliance cannot be placed upon the argument sometimes brought forward as favoring the dumping of certain manufactured products, namely that this plan results in economies because of the increased production made possible thereby. Furthermore, the anti-dumping legislation which has been enacted in some countries would be a limiting factor in the employment of dumping as a method of supply adjustment. Even though dumping could be extensively practiced, highly profitable prices to the producers could not be maintained permanently thereby because such prices would encourage production and the increased surplus would mean that a larger proportion would have to be dumped with a lower average price for the total supply.

It has been suggested that an organization which has in its membership one hundred per cent of the growers can take care of any surplus by providing for two sets of pools, one to include the regular supply and the second to consist of the surplus. The amount which a grower would be permitted to produce for the first pool would be limited and the balance of his deliveries would go into the second pool. Such a scheme would be faced with several difficulties. For one thing, no commodity is one hundred per cent organized and the chances of procuring such a result are very remote. If such a membership could be obtained, there are always other farmers who are potential producers of the commodity. The division of the members' deliveries into the two pools would involve a number of administrative difficulties. Then, after the division has been made, what is going to be done with the product in the surplus pool? Is it merely to be held in the hope that a shortage at some future time will enable its sale at profitable price? It it going to be dumped in foreign markets? Is it going to be destroyed? It is possible that this idea has sprung from the plan employed by some milk marketing associations of selling part of their receipts as

fluid milk and the surplus in the form of by-products and averaging the returns. The plan referred to, however, is an entirely different proposition. It is evident that such a scheme would not get very far.

The possibilities of cooperative marketing associations in affecting the amount of production, as has been suggested, lie not in arbitrary control but in whatever ability they may have in influencing the production plans of their members. One argument in favor of cooperative marketing is that the association is in a much better position than is the individual member in obtaining and using market information. The larger volume of business supporting it and the trained ability employed by it presumably enable the association to tap a greater variety of sources of information. Theoretically at least, the possession of this information is helpful to the association, not only in determining upon its marketing policies but also in supplying advice to the members to guide their production operations. If supply is being increased faster than the demand, an association should discover this tendency promptly and drive it home to the members. Most assuredly, this is an end towards which our marketing associations should work. For the most part, however, it must be admitted that their influence at present is largely ineffective. This is due in part to the fact that their endeavors have been exerted mainly in other fields. Many associations probably would find it a profitable investment to spend more money for research and study relative to market conditions.

Any influence which an organization can bring to bear through the giving out of information will be largely effected through its points of contact, especially its field workers and publicity departments. Many of the larger associations publish papers for regular distribution to their members and these should constitute an invaluable means of carrying real information and education to the members. Unfortunately so much of the publicity efforts and the representations to members in many organizations has consisted of glowing recitals of achievements and the promising of future accomplishments. In such instances information regarding production and mar-

ket conditions has been relegated to a subordinate position. One is almost tempted at times to conclude that some associations are afraid to emphasize such information very much because it may be taken as an admission of an inability to perform all the things expected of them. If the cooperative associations are going to distribute information that will be effective factors in determining upon production policies, they need to embark upon a program of real education which will teach their members the fundamentals of price and the factors affecting price. Too often the supporters of cooperative enterprises rely upon some supernatural control over markets and prices which such associations are assumed to possess. The sooner cooperative organizations disclaim any such powers the quicker the rank and file of members will come to understand that the way to control prices is to control the factors determining prices and that they as individuals possess a large measure of control over the important factor of supply.

Some associations apparently hesitate to make suggestions regarding production adjustment for fear that such recommendations may furnish the basis for legal action against them on the grounds that they are conspiring to limit production in order to hold up prices. Such fears would be unwarranted were the limitations of cooperation in this regard more generally understood, but at present it is possible that a line of argument of plausible sound might be formulated against an association on these grounds. We ought to reach the stage of development soon where we will appreciate that effective farmer monopolies of any degree of permanence appear beyond the realm of possibility. Arguments for reduction during a period of profitable prices for a product are seed sown on barren ground. Such recommendations bear fruit only when there is evident need for an adjustment, and certainly there can be no sound legal objection to these recommendations under such conditions.

It is not suggested that associations should endeavor to restrict production by means which would be of questionable legality under a reasonable interpretation of law. It is not

a matter of securing definite agreements to an arbitrary plan of adjustment nor need it be a case of urging growers to limit their individual production to specified amounts. The principal service of associations in this field will consist of furnishing facts regarding conditions to the farmers and of interpreting the significance of these facts to them. When this has been done, reliance must be placed on their business acumen to base their production upon these facts.

The preceding discussion of the possibilities of accomplishing results through the distribution of facts applies to all marketing associations, but especially to the large-scale enterprises. Another line of influence over the volume of production is open to associations handling certain localized products for which the organization plays a leading part in the determination of price. A favorable price stimulates production. That is more than a mere theoretical assumption. It is a demonstrated fact. An association, therefore, which has the power to determine what prices it will ask for the commodities it sells, through that power exercises considerable control over future production. There are instances of associations which have established asking prices at attractive levels and for a time have been able to sell all of the products at those prices. At times campaigns to stimulate consumption have been effective aids in obtaining the prices thus established. The case of raisins referred to above is an illustration. Profitable prices were fixed and ample demand at those prices was brought into the market by means of effective advertising and distribution. But production was stimulated by these prices and a readjustment of asking prices eventually became necessary.

It is evident that if production responds to price, then organizations which are in a position to determine the prices at which they will offer their holdings can do much to hasten necessary production adjustments by adopting a courageous policy of foreseeing difficulties of oversupply and forestalling them by keeping the prices at a point where production will not be unduly stimulated. Granted, it takes nerve for an organization formed to get higher prices, to take a long-time view

and be contented with a lower immediate price than could be obtained[1] Such a policy, however, may prove to be wise in that it avoids a future slashing of prices which might be found necessary in order to move the increased production resulting from high prices in the present. Here then is a remedy which actually will work. The only drawback is that it is not popular. A management swept into power upon the appeal that profitable prices could and would be established finds it hard to satisfy the members with anything less. This is not a fault of the principle, however, and the answer is that organizations must stop sweeping management into power on waves of that kind. Organization management must develop its policies with an eye to what the future has in store. If the organizers have kept their feet on the ground and their heads out of the clouds and have not oversold the organization, the problem is materially simplified. If reliance has been placed upon the ability of the proposed organization to control prices, the educational work needed to correct this mistaken assumption cannot be started too soon. It is not an easy problem to solve, but if cooperative marketing is to grow and expand and if it is going to become an influential factor in stabilization of production it must be solved. An organization cannot claim arbitrary price control and then expect to get much response from its members to an appeal for reducing acreage of the commodity handled. This is an oil and water combination which will not mix, and the sensible procedure is to get away from the unsound idea of price fixing. We also need to bear in mind that the problem of production adjustment is not one of restricting output so that highly profitable prices will be obtained. That is outside the realm of possibility, and were it not, it would soon be curbed by restrictive legislation. The problem is one of reasonable adjustments so that the disastrous consequences of overproduction may be eliminated.

[1] This principle was observed by the American Cranberry Exchange during the 1921-22 season (See U. S. D. A. Bul. 1109). The short crop of 1921 would have made possible the sale of the supply at high prices. The Exchange, however, preferred to put its holdings upon the market at such a rate that the resulting prices would not discourage consumption. Higher prices would have lost many consumers and their good will would have had to be cultivated later at considerable expense. The Exchange based its policy on a long-time view and not on the immediate situation.

Cooperative marketing is not arbitrary price-control and that is not its purpose. Cooperative associations cannot render the greatest service possible in the field of production adjustment until that fundamental fact is fully appreciated. If only reasonable and rational claims relative to the possibilities of an association are made during the organization period, this problem will be simplified. Associations need to engage in constructive educational work which will teach the members the real purpose of their organization and give them an understanding of the part played by economic forces. Here also is a place where agricultural colleges and other public agencies can render a very helpful service. Fortunately, as time goes on experience will teach us what we can reasonably expect from cooperative marketing. It will show clearly that the hope of price control is not justified. This will place greater importance upon the economic factors. The demand of members for crop and market information should increase, and the efforts of the management to obtain and distribute such information will be increased. The effect of cooperative marketing in this field consequently should be of greater significance in years to come than it has been up to the present time.

DISCUSSION BY PAUL L. MILLER

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The conclusions and findings of Professor Jesness respecting the economic possibilities of production control through cooperative marketing organizations seem to me to be sound. His paper is indeed very interesting and stimulating. Although he has definitely limited himself to a single aspect of the significance of cooperation in agriculture, he has selected for treatment a consideration that enables him to strike directly at a certain cooperative doctrine that is very prevalent, as he shows, in spite of its unsoundness.

But he would be the first to say that his paper, entitled the Relation of Cooperative Marketing to the Adjustment of Agricultural Production, leaves unconsidered several aspects of the question of what cooperative organizations can accomplish by way of internal adjust-

ment of our agricultural industry. I think it may be said also that Professor Jesness' treatment suffers somewhat in clearness and logic because he has confined his considerations too closely. For example, although it demolishes quite completely the false notions concerning the potentiality of cooperative marketing organizations to exercise a direct control over production for the market, it seems to me to fail to indicate the proper course of procedure for the so-called "commodity-control" organization that is able to secure substantial price advantage through effective bargaining, and yet hesitates to exercise its full capacity because of the imminence of a greatly augmented supply. Viewing the matter of cooperative functioning from the single angle of production control, Professor Jesness concludes that the way of wisdom for such an association would be to adhere closely to existing marginal supply price because of the danger of over-expansion that a higher price might entail. If one admits such a course to be expedient in a particular situation he is very curious to know about this alleged bargaining power of certain cooperatives and whether it is a reality in many market situations. If it is, then it is something in itself that organized farmers may do, theoretically at least, to improve their industrial status. Does there not seem to be something incongruous in the notion that organized farmers dare not press their legitimate economic advantage in the markets because the resulting price advantage would lead them to industrial disaster?

At another point Professor Jesness stops a little short of making his argument entirely clear because he does not give sufficient consideration to this bargaining theory of price-making in agricultural markets. In speaking of the failure of many cooperatives to encourage and help their members to confine their production to the most profitable proportions, he points out, rightly it seems to me, that this failure is due to the hesitancy or unwilingness of such organizations to admit frankly that they are unable to secure for their members a real bargaining advantage in the markets. As a matter of fact these organizations were set up, partly at least, in the belief that organized farmers, even in the staple commodity trades, can secure higher prices merely by demanding them. If they cannot, then much of the cooperative machinery in some trades is undoubtedly unnecessary, and certainly some of the merchandising methods, as commodity pooling, are clumsy and wasteful. At any rate it is illogical to expect some of our commodity control organizations effectively to assist their members to a properly adjusted production program because *they embody the bargaining theory of price-making.* Many of their practices and methods are undertaken in the belief that markets may be forced to return to farmers at least cost of production. To admit that merely meeting the market exhausts their merchandising possibilities would be to advise the membership that it is supporting superfluous and even wasteful activities.

Further in respect to this point, Professor Jesness might have employed his logic more completely by showing that some of our comprehensive marketing organizations not only fail to help their members to adjust their production program, but also induce maladjustment, because they embody false price doctrine and seek to relieve entrepreneurship in agriculture from marketing responsibility, or rather they pool this responsibility to the disadvantage of the properly trained and highly expert business farmer and to the advantage of the poor business man in agriculture. In those agricultural trades where the alert and well trained and well equipped farmer or a relatively small group of farmers can realize full market value for their produce or, in other words, can fully merchandise their products, seasonal pooling is probably unstabilizing, because it puts the farmer or a community of farmers who would be marginal or even sub-marginal because of their failure to employ good market technique and merchandising practices, on the same basis as the farmers who are superior in this respect. To some extent, therefore, production is augmented by the survival of incompetent farmers to the great disadvantage of the capable farmers. Such business practice tends to deter economic adjustment in the industry and, in a measure, to reduce all farmers in the trade to a common level of depression.

In this connection one may raise the question of the nature of the considerations that prevent group control of production programs in agricultural trades. Professor Jesness very clearly points out that the individuals of an organized group will not adhere to a reduction of acreage program which each admits would put the whole industry upon a much better basis. Each seems to agree to the advisability of such a program, without expecting to abide by it, but hoping that others will. This fact is quite commonly cited as evidence that farmers will not work together in this way even though it would be to their mutual advantage to do so. As Professor Jesness says, however, it is to the interest of the individual to have as large a volume as possible when others curtail their production sufficiently to make a strong market. But after all, is it not merely short-sightedness that renders such a program unstable? If the individual fully realized or, when through experience he does come to realize that he must act in good faith in order to secure similar cooperation from others, why would he persist in being contrary? I think the answer is that he would not, *if he were situated just as are all other producers of the commodity.* But the facts are usually that, at any given price basis, some farmers in a particular trade can profitably expand their operations and others would gain by contraction. It would certainly be uneconomical for intra-marginal producers to restrict their operations in order to relieve the market while there are sub-marginal producers who are chiefly responsible for the depressed market conditions. Even under effective

monopoly control, advantages would ensue only if the restricted output were furnished by the most efficient plants and the others diverted to other uses. It would therefore appear that any attempt at control of production by means of a uniform program for reduction of acreage is thoroughly unsound from all aspects because it fails to secure the needed adjustment at the margin. Marginal and submarginal producers are benefited at the expense of the more efficient or more favorably situated producers, and total profits in the industry are not enhanced.

Thus far I have mentioned only a few of the points Professor Jesness makes which seem to me of special interest. Now I wish to mention other considerations relevant to this question of what cooperative organizations can accomplish toward securing and maintaining a more stable agricultural industry. If I understand popular sentiment correctly, much besides production control is expected of cooperation. I wonder if it is not true that there has been more cooperative effort exerted in the hope and expectation of great price advantage from centralized selling than in the hope that through cooperative agencies production may be controlled and regulated so as to maintain a satisfactory price level in the agricultural markets. The exponents of "commodity control," I believe, are quite generally bargaining theorists, although they are not by any means of one mind on the subject. But bargaining doctrine is very prevalent. It is frequently said by cooperators that the farmer is the only producer who persists in competing with his neighbors. He must emulate the industrialists who have organized to maintain their prices. When the farmer sells he takes what is offered, but when he buys he must pay the price demanded. He must organize to demand a price that will reward him sufficiently. So, if for no other reason than to allay erroneous notions, we should consider carefully the extent to which cooperation is necessary or efficacious in the realization of maximum prices for any given crop.

I should like to suggest three major considerations that I think this subject of cooperation entails: (1) production control through cooperation, discussed by Professor Jesness in his paper; (2) price control, to be secured through a proper approach to and influence in the markets; (3) the importance of cooperation to the most economical conduct of the farm business. I am not thinking only of what is commonly designated as producers' cooperation in agriculture, but also of much that is termed in some of the text books as "distributive" cooperation. I mean to include here all cooperation which exists or may exist to enable the farmer to perform more economically all those processes which modern farm business comprises, whether they be buying or selling or the processes involved in the technological operations of the farm.

In conclusion, permit me to state briefly the significance of each of these economic departments of cooperative activity as a means to a satisfactory agricultural economy. Collective action for the purpose of securing as nice an adjustment as is possible between the farmers' production program and his opportunities in the markets does not call for cooperative organizations as they are known and commonly thought of, but rather for associations among farmers analogous to the trade association which is coming to be of such great importance among all groups of traders and industrialists. Such associations in agriculture might have two main lines of activity, as I believe they have or are coming to have, in those trades where they are already potent factors for stabilization. One of these classes of activity would be to supply the membership with all salient market news and data in such an assimilated and interpreted form as to be most useful to the individual farmer. As Professor Jesness has explained, group control of production can only be accomplished satisfactorily in this manner. Consequently, organized activity for this purpose is most important indeed when it will assist the individual farm entrepreneur to make a better selection of enterprises and to anticipate and understand the peculiar exigencies of his particular business. The other major class of activity that these agricultural associations might have would include economic study and analysis of the farm business in the particular trade. These studies would be for the purpose of revealing as precisely as possible the types of farming represented in the trade and the whole range of costs and conditions under which the production of the particular commodity takes place. The purposes to be accomplished are to enable each farmer to have a measure of his effectiveness and relative efficiency in the trade and to learn the nature of his particular business. The results would be to make him a more rational entrepreneur and to stabilize production. In a word, agricultural associations with these activities would be for the purpose of helping the farmer to become an economic supplier in his markets and to have effective reservation prices. In many trades, organization for other purposes will be relevant. Here I am speaking only of rational organized effort for production control. Under present conditions the farmers do not compete in the precise economic sense, for their productive activities are not undertaken in the light of available information concerning their best opportunities. These opportunities are defined by demand conditions and supply conditions. It is just as important for the farmer to know the factors conditioning supply as those that determine demand, if he is to be an intelligent supplier. It will then appear that this sort of association is for the purpose of enabling farmers to compete systematically or rationally rather than fortuitously and at random. I believe that when we have more fully constructed cooperative theory it will be clear that coopera-

tion is mostly for this purpose, contrary as this opinion may be to popular notion.

With reference to cooperative organization for price control I shall say little more than that I believe that it is well advised in some trades and most futile in others and that intelligent investigation and observation of trade conditions will generally reveal where it is appropriate. In many fluid milk markets dairymen need to bargain collectively in order to receive maximum prices for a given market volume. This is true because the dealers are in collusion or the individual dairyman may not readily know demand well enough to bring out a competitively determined demand price. There are also instances in the fruit and vegetable trades where this process is relevant because of existing market conditions. Conditions that warrant collective bargaining in agriculture may conceivably exist at times in any trade and probably will not exist continuously in any trade.

Finally, cooperative organization can accomplish much by way of enabling the farmers to perform more economically many of the processes of their business. I think it goes without saying that so-called cooperative production in agriculture has by no means been fully exploited. It is a most fertile field for the profitable extension of cooperative effort. And certainly one will encounter a very enthusiastic appreciation of what cooperation can do to effect economies in the merchandising processes of the agricultural business. In some cases organization for more efficient disposal will be for the purpose of providing for the most efficient performance of certain functions as standardization and demand creation that the business of farming entails in certain trades.

In order to point out as precisely as possible what farmers may accomplish through cooperative organizations we would need to examine farm economy very carefully and to make a thorough canvass of past and present cooperative effort. This procedure would enable us to formulate rather definitely the economic role of cooperation in agriculture. These formulations would consist of deductions supported by data secured by observation and statistical research and by logical analysis. With these in mind we may investigate carefully the institutional conditions in any particular trade to discover precisely at what points and for what purposes cooperation is appropriate or would be an adequate means or remedy.

SOME PHASES OF THE HARD WINTER WHEAT GROWER'S PROBLEM IN READJUSTMENT[1]

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Adjustment in agriculture means chiefly adapting production to the conditions affecting it. During and following the World War the conditions affecting agricultural production in the winter wheat belt changed rapidly. Prices of farm products rose sharply during the war but fell precipitously in 1920. Production costs in terms of labor and capital goods increased less rapidly than the prices of farm products. But they have remained relatively higher than farm prices since 1920. These changing price relationships induced farmers to effect changes in their farm business. In many instances the changed plans and policies were scarcely in effect before shifting price relations again resulted in the farmer being "out of step" with economic conditions. Farmers attempted to adjust to the price levels of 1917 to 1919 only to find themselves producing under changed price relations of 1920 and subsequently. The problems of adjustment have persisted and in more acute form, for to the problem of adjusting to the price conditions following 1920 have been added the problems of correcting the mistakes made in attempting to adjust to the war prices of 1919 and the immediately preceding years. In many instances these mistakes were expressed in debts and to these debts have been added those made necessary by the low returns from farming since 1920.

The prosperity of the war period did not increase the permanent economic well-being of all farmers, but it encouraged many of them to expect such conditions to continue, and they borrowed funds and invested their incomes anticipating continued prosperity.[2] But the "lean years came and devoured the fat ones!"

[1] This paper was read at the Fifteenth Annual Meeting of the American Farm Economic Association, held in Chicago, December 31, 1924.

[2] This has been well stated by Benjamin M. Anderson, Jr., in the bulletin of the Chase National Bank of the City of New York, Vol. IV, No. 5, "The Weakest Point in the Farmer's Financial Policy." Oct. 23, 1924.

The Problem.—The problem of adjustment as it confronts farmers at present consists of adapting their practices to the changed conditions of production, both with respect to price relations and to their fixed resources. Many of these fixed resources are investments made on borrowed funds during the war years and these funds are not yet repaid. Furthermore, some of the changes made during these times do not permit a return to former conditions. Careful consideration of these changes as well as of the altered price relations is essential in a discussion of the wheat grower's problem in adjustment.

Changes in Conditions.—This problem in readjustment involves two sets of changes. First, changed price relations which are familiar to students of the economic situation. Second, changes in the wheat growers' resources that are available for production and changes in the demand for wheat. The first,—price changes,—will not be discussed further, excepting as is necessary in discussing the second set of changes. The second, or the changes in the farmer's resources and in the markets for his wheat, are in part the result of price changes, but since changes in the conditions of production lag behind price fluctuations and some modified conditions tend to be permanent, this second set of changes must be given further consideration.

A frequent mistake made in discussing the problems of wheat production is to treat all wheat as though it were alike. Different kinds and grades of wheat satisfy differing demands. Certain kinds and qualities of wheat are in keen demand while other kinds or qualities may find very indifferent demand in the same market and at the same time. Consequently, the problems confronting wheat growers vary with the kind and quality of wheat produced.

Groups of Wheat Growers.—The wheat growers of the United States may be divided into at least five groups based in part upon region and in part upon the kind of wheat produced. These are: (1) the soft red winter wheat growers

of the central and eastern portions of the United States; (2) the hard red winter wheat growers of Kansas, Nebraska, Colorado, Oklahoma, and Texas; (3) the hard spring wheat growers of the north; (4) the durum wheat growers, also of the north; and (5) the wheat growers of the Pacific Coast region. The latter group includes growers of wheat of various kinds and grades, but because of freight costs over the Rocky Mountains most of this wheat is milled on the Pacific Coast or exported and does not come into direct competition with the wheat of the other regions of the United States.

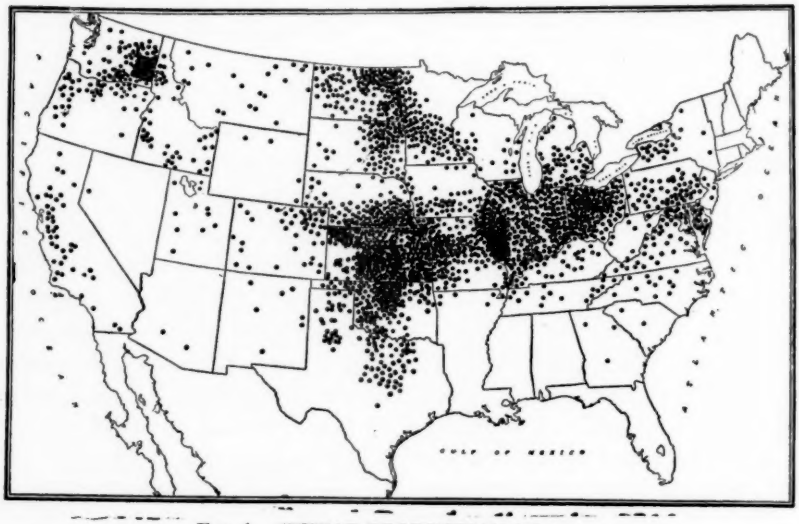

FIG. 1.—WHEAT PRODUCTION IN 1919.
1 dot = 400,000 bushels.

Each of these groups of wheat growers has distinct problems in adjustment. Some of these problems are similar for two or more groups, while others pertain to but one group. The present paper is confined to the problem of the hard winter wheat growers. The writer is most familiar with the problems of this group and more complete data are available for Kansas (which is a representative portion of

the hard winter wheat belt) than for the other regions. In this analysis it is assumed that Kansas data are typical of the entire region.

Changes in Conditions of Production

The war period and the years following it saw many changes in the conditions affecting the production of wheat and other farm products in the hard winter wheat belt. These changes are significant and a thorough understanding of them is essential to intelligent aid and direction in further adjustment. For purposes of analysis, Kansas has been divided into three divisions based upon the development of wheat production, upon differences in rainfall, and other factors. The eastern division of the state is a well developed general farm-

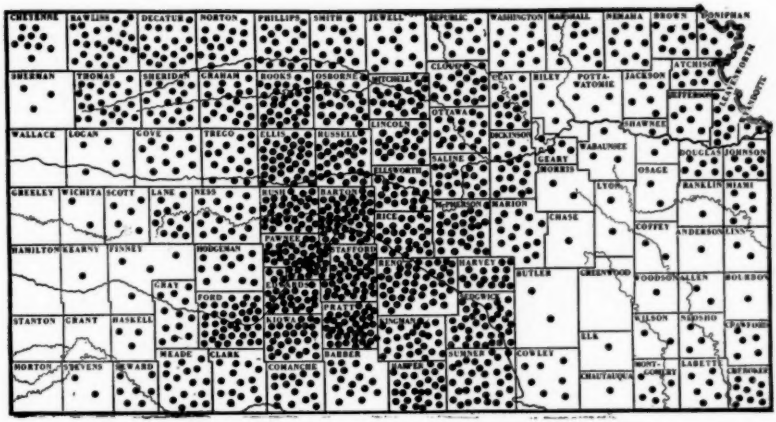

FIG. 2. ACREAGE OF WHEAT HARVESTED IN KANSAS
Based on average of ten-year period—1908 to 1917 inclusive
1 dot = 5,000 acres harvested

ing region (excepting the Flint Hills grazing portion), where soft winter wheat is more frequently grown than hard winter wheat and the hard winter wheat frequently is of low quality due to a high percentage of yellow berry. The central portion of the state is the heart of the hard winter wheat belt. On its eastern edge some soft wheat may be grown, but the bulk of the wheat is hard winter of good quality.

The western portion of the state has developed more recently and some of it is still in process of development. The wheat grown in this region is hard winter, usually of good quality, and is in keen demand for domestic milling and baking purposes.

Population Changes.—Agricultural adjustment is the shifting of human relations. Population changes are of fundamental importance in considering possible further adjustments. Farmers relinquish their farms slowly and reluctantly. To do so may mean the loss of the savings of a lifetime. Land usually reverts to a lower use only under privation, disappointment, and discouragement to those employing it for a higher use. These are the conditions that carefully and intelligently directed adjustment should avoid whenever possible. The farm population of the hard winter wheat region has changed in numbers and distribution since before the war. Plans for further adjustment must not ignore these changes.

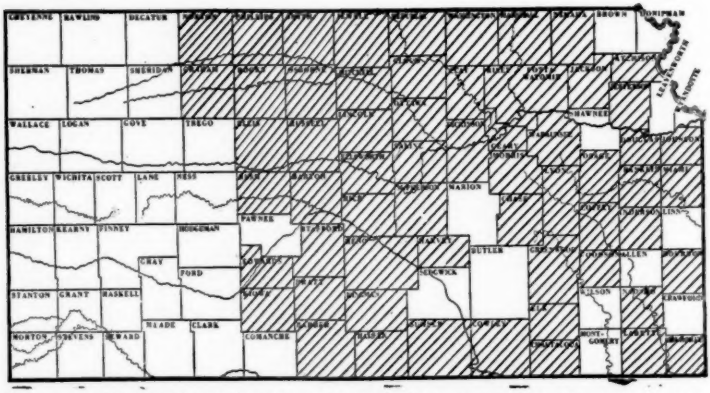

FIG. 3. CHANGES IN FARM POPULATION IN KANSAS, 1915 to 1922
(Shaded counties decreased in farm population, unshaded increased.)

The farm population[3] of Kansas declined slightly from 1915 to 1922. In eastern Kansas the farm population remained stationary, in central Kansas it decreased, while in

[3] Farm population as used in this paper includes all persons living outside incorporated places as given in the reports of the Kansas State Board of Agriculture.

TABLE I.—FARM POPULATION OF KANSAS, 1915 AND 1922.*

	1915	1922	Increase	Decrease
The State	850,870	847,718	------	3,152
Eastern Kansas	434,137	434,140	3	------
Central Kansas	324,737	305,656	------	19,081
Western Kansas	91,996	107,922	15,926	------

*Data adapted from biennial reports of the Kansas State Board of Agriculture for 1915-16 and 1921-22.

western Kansas it increased. The trend of farm population in eastern and central Kansas corresponds to the apparent trend in the well developed general farming regions of the United States.[4] The increase in farm population in western Kansas indicates a developing region. Subsequent data further support this view. (See Table I and Figure 3.)

Area in All Crops.—The area in all crops in western Kansas expanded more than three million acres between 1913 and 1922. Prairie sod was broken and the land used for the production of crops. (See Table II.) In this section of the

TABLE II.—AREA IN ALL CROPS IN WESTERN KANSAS, 1913 TO 1922.†

Year	Area in all Crops (acres)
1913	6,828,327
1914	7,846,094
1915	7,359,126
1920	9,094,632
1921	8,880,345
1922	9,133,971

†Data from biennial reports of the Kansas State Board of Agriculture.

state more than one-half of the land in farms is now broken, and prairie sod once broken cannot be restored readily. It is estimated that ten to forty years or more would be required to reestablish naturally a stand of buffalo and other native prairie grasses of western Kansas after they have been completely killed out, and a year or two of cultivation will kill them. Any program to return a large part of this land

[4]This is indicated by the trend in the number of farms and in the total population in regions that are primarily agricultural as shown by Census figures.

to grass could probably not succeed under private ownership. Private enterprise would not be willing to forego the possibility of income for so long a period. Under private ownership, therefore, this land is in cultivation to stay, and there are other factors, to be mentioned later, which are helping to keep it in cultivation.

Area in Wheat.—The war period saw rapid changes in the area in wheat in the hard winter wheat belt. The guaranteed price and the appeal to patriotism encouraged expansion. The expansion in the various sections of Kansas is shown in

TABLE III.—AREA SEEDED TO WHEAT FOR THE CROP OF THE YEARS GIVEN, IN THE VARIOUS SECTIONS OF KANSAS.*

Years	Eastern Kansas (acres)	Central Kansas (acres)	Western Kansas (acres)
1913-1915 Av.	1,071,891	5,737,990	1,970,202
1917-1919 Av.	1,684,978	5,975,251	2,704,958
1921-1923 Av.	1,912,953	6,477,913	3,351,398
1924	1,136,142	5,484,356	3,140,687
1925	912,000	6,150,000	3,442,000
1921-1923 acreage in per cent of 1913-1915 acreage	178.5	112.9	170.1
1924 acreage in per cent of 1913-1915 acreage	106.0	95.6	159.4
1925 acreage seeded in per cent of 1913-1915 acreage	85.1	107.2	174.7

*Data from biennial reports of Kansas State Board of Agriculture.

Table III. During the three year pre-war period 1913-1915 a little more than one million acres of wheat were seeded annually in eastern Kansas. During and following the war this section expanded its wheat acreage until during the period 1921-1923 nearly two million acres were seeded annually. The 1924 acreage seeded dropped back almost to, and the 1925 acreage seeded is below, the pre-war level. The area seeded was greater immediately following the war than during the war. The farmers of this part of the state had increased their wheat-growing equipment. With rather fixed areas of land, and extra labor costs remaining high,

the production of wheat permitted the use of their land with less hired labor than if more intensive crops were grown. This, at least in part, explains the changes in wheat acreage in this section.[5]

In central Kansas the area seeded to wheat did not expand so much, either relatively or absolutely. This region was already growing a large acreage of wheat, and materially increased production would have required additional labor that could not be secured readily during the war. After the war it was too costly in relation to the price of wheat. The adjustment of the acreage seeded to wheat to the lessened demand for all kinds of wheat has gone farther in relation to pre-war acreage in this section than in either of the others. The acreage seeded for the 1924 crop was but 95.6 per cent of the average 1913-1915 seeded acreage and the 1925 seeded acreage is 107.2 per cent of the pre-war acreage.

In western Kansas much of the expansion in the wheat acreage has been maintained. The 1921-1923 peak in acreage seeded was 170 per cent of the 1913-1915 acreage and the 1924 acreage dropped only to 159.4 per cent of the 1913-1915 average acreage, while the 1925 acreage seeded is higher still, being 174.7 per cent of the pre-war acreage. This region seems to have increased its wheat acreage permanently, or at least for several years to come. In view of the increased area in cultivation shown in Table II, this seems very probable. Other factors are also encouraging increased wheat production in this section of the hard winter wheat belt.

The wheat acreage of Colorado is an extension of the hard winter wheat belt on its northwestern edge. The trend of wheat production in that state shows clearly that the same forces are causing expansion there as in western Kansas. The 1915 area in wheat was 570,000 acres and was larger than for any preceding year. The 1924 area was 1,705,000 acres, or nearly three times the 1915 acreage. The 1924 acreage was exceeded only in 1921 when 1,719,000 acres were harvested—an increase of only 14,000 acres.

[5] See *The Intensity of Cultivation* by B. H. Hibbard in Quarterly Journal of Economics, Vol. XXXVI, No. 4, August, 1922, for an excellent discussion of the problems involved in such changes.

The trend of the acreage of wheat in Nebraska and Oklahoma closely follows the totals for Kansas and encourages the assumption that, if detailed county by county figures were available, the same tendency to expand wheat production on the western edge of the hard winter wheat belt would be evident. These changes in acreages of the various crops occurred throughout the winter wheat belt.

"The largest addition to the winter wheat area was made in the Great Plains States of Nebraska, Kansas, Colorado, Oklahoma, and Texas. By 1919 the wheat acreage in these states had been expanded by over 13,450,000 acres. Corn was reduced 8,275,000 acres and better than 11,000,000 acres of meadow and wild pasture land were plowed up and planted to crops. Much of the new land sown to wheat was located in the semi-arid part of the region where the harvested wheat acreage between 1909 and 1919 more than trebled. Crop acreages in the region as a whole are still considerably out of line with their pre-war relationships. The wheat area is 7,240,000 acres above and that of corn is about 4,600,000 below the pre-war average. No reduction appears to have been made in the total area of cultivated land which at the present time is almost 12,500,000 acres over the average before the war." [6]

Clearly, wheat production in the western part of the hard winter wheat belt is being expanded in spite of low prices and the resultant hard times, and notwithstanding the admonitions to decrease wheat production. This movement needs explanation. The explanation is to be found in the changing conditions of wheat production and the increased demand for certain grades of wheat.

The Use of Machinery.—Recent years have brought important changes in the use of machinery in farming in the hard winter wheat belt. Larger and better types of machinery are now in use than were used prior to the war. Tractors have been made in types and sizes adapted to the needs of wheat growers. The number of tractors in Kansas increased from 2,493 on March 1, 1915, to 25,019 on March 1, 1924. (See Figs. 4 and 5.) The tractor permits the use of less man labor by substituting capital goods in its place. The topography of the Great Plains area is well suited to

[6] The Wheat Situation, a Report to the President by Henry C. Wallace, Secretary of Agriculture, transmitted November 30, 1923. pp. 53-56.

the use of the tractor in wheat production. Its use can be expected to continue if labor costs remain high. Another outstanding change is the use of the small combined harvester-thresher. Prior to 1917 Kansas had only a few, if any,

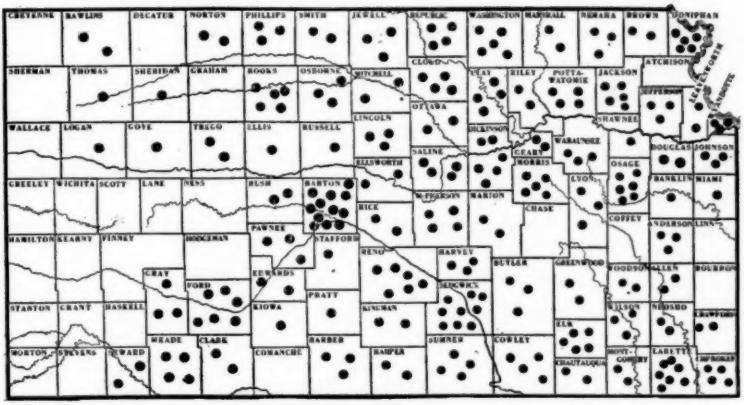

FIG. 4. TRACTORS IN KANSAS, MARCH 1, 1915
STATE TOTAL—2,493

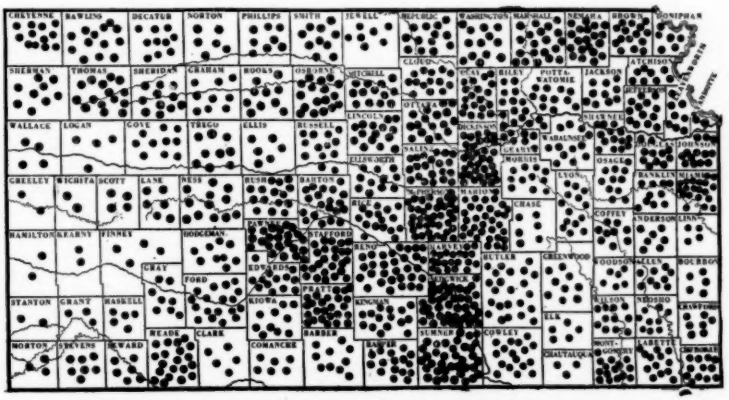

FIG. 5. TRACTORS IN KANSAS, MARCH 1, 1924
STATE TOTAL—25,019

such machines. On March 1, 1924, there were 3,116 of these machines on Kansas farms. (See Fig. 6.) They make possible cheaper wheat production in central and western Kansas since they save much labor. Most of the owners of

these machines claim savings of at least one-half in the cost of harvesting and threshing their wheat with them as compared with headers and threshing machines. The machines in use in the state at present are sufficient to harvest approximately one million acres of wheat and there is every reason to expect that many more will be purchased and used as farmers become financially able to buy them. Stafford County now has sufficient combines to harvest nearly one-half of its wheat acreage. These are some of the more outstand-

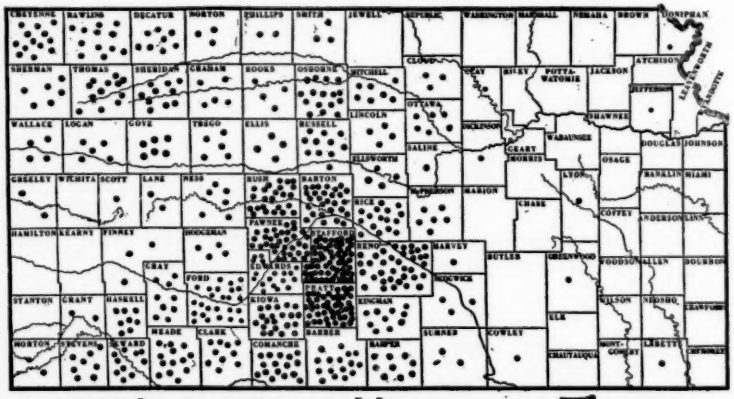

FIG. 6. COMBINED HARVESTER-THRESHERS IN KANSAS MARCH 1, 1924
STATE TOTAL—3,116

ing changes in the use of machinery in wheat production but other implements also have been improved and enlarged.

The evidence indicates that farmers of the central and western portions of the hard winter wheat belt can grow wheat with less cost than in earlier years. All the saving in labor is not a saving in cost, since additional capital goods are used; but, making allowance for these increases in capital costs, it still seems probable that wheat production costs are lower. This will be further discussed in connection with the control of the hazards in wheat growing.

Crop Production Practices.—Improvements in crop production have affected the hard winter wheat belt materially. New crops that are better adapted to the region and better adapted strains of existing crops are now grown that were

not common ten to fifteen years ago. In 1916, 31,386 acres of sudan grass were grown in Kansas; in 1923, 156,718 acres of this crop were grown. Until recently sweet clover was considered a pest; now it is accepted as a crop of value and 48,891 acres of the crop were grown in 1923. Sweet clover and sudan grass are pasture and forage crops that make it easier for the wheat grower to keep livestock. Both crops are increasing in importance in the hard winter wheat belt.

Increased use of improved varieties of crops in the hard winter wheat belt has marked recent years. Kanred,—an improved strain of hard Turkey wheat,—yields an average of approximately three bushels more than the common Turkey and Kharkoff varieties. It was first distributed for general use in Kansas in 1918, and by 1924 it is estimated that three million acres of this variety were grown in Kansas[8] Blackhull, another improved strain of hard winter wheat, also has been widely adopted. Kanota oats,—a selected strain alsó developed by the Kansas Experiment Station,—outyields common Red Texas by ten bushels an acre. This strain was first distributed in 1919, and it is estimated that 300,000 acres were seeded with it in Kansas in 1924[8] Improved varieties of corn and the sorghums have been developed and are now in use. The experiment stations in other hard winter wheat belt states have developed strains adapted to their conditions.

Improved cultural practices in the production of wheat and other crops in the hard winter wheat belt have been adopted. Farmers are adopting the methods that are best for their conditions. These improved practices aid in conserving moisture and plant food and, combined with improved varieties and crops, they enable the hard winter wheat grower to better cope with the hazards of agricultural production in the western winter wheat area. This is particularly true of early plowing of land in preparation for the seeding of wheat. This practice has increased so remarkably, as a result of the work of agricultural colleges and of the development of the tractor, that it is now a conspicuous feature of hard winter wheat belt farming.

[8] Estimated by the Department of Agronomy, Kansas Agricultural Experiment Station.

The effect of increased ability to control these hazards is illustrated by Figs. 7 and 8, showing the acreage of wheat seeded in per cent of the acreage harvested in Kansas coun-

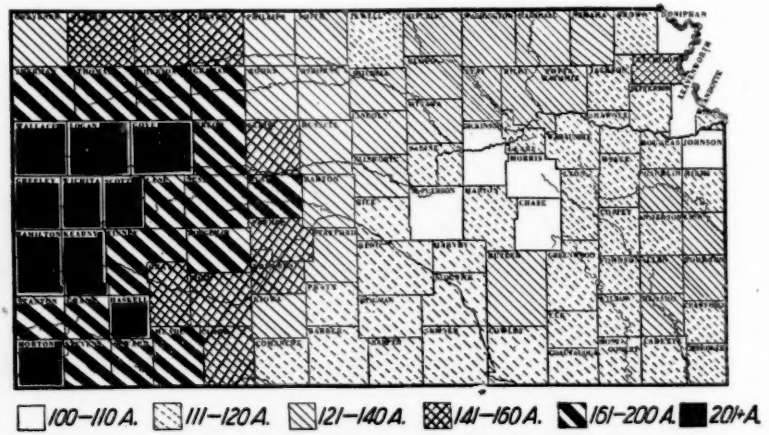

FIG. 7. RATIO OF WHEAT SEEDED TO WHEAT HARVESTED AVERAGE—1911 to 1917, INCLUSIVE
State Average.....133 A.
Area Harvested.....100 A. in all cases.
Figures given are the areas seeded for each 100 A. harvested

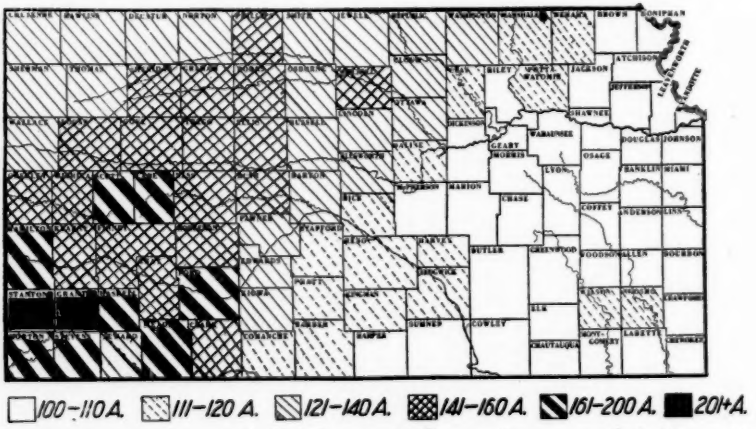

FIG. 8. RATIO OF WHEAT SEEDED TO WHEAT HARVESTED AVERAGE—1914 to 1923, INCLUSIVE
Figures given are the acres seeded for each 100 A. harvested

ties for the periods 1911 to 1917 inclusive and 1914 to 1923 inclusive. Figures on abandonment are not available for the years immediately prior to 1911. It will be noted that

in the later period more of the seeded acreage was harvested. These figures probably accentuate the extent to which farmers are controlling the hazards. Recent years have been more favorable for wheat production than the years from 1911 to

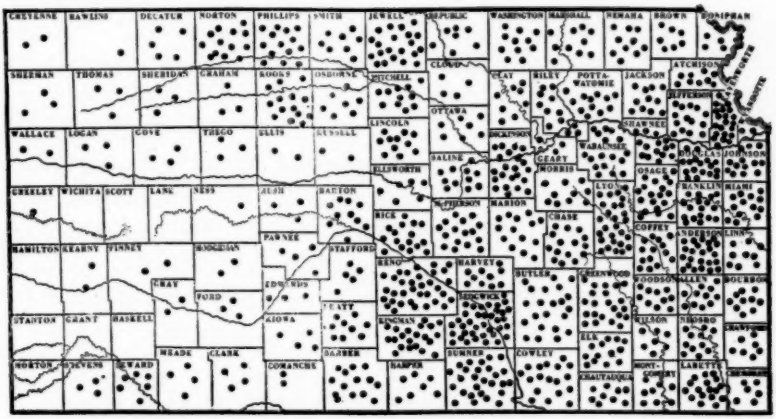

FIG. 9. SILOS IN KANSAS, MARCH 1, 1915
STATE TOTAL—9,712

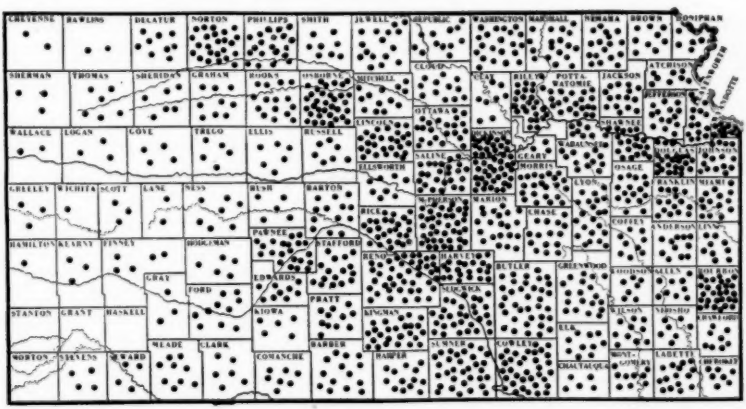

FIG. 10. SILOS IN KANSAS, MARCH 1, 1924
STATE TOTAL—13,801

1913. However, only part of the change can be attributed to weather conditions. The remainder is the result of improved practices that reduce crop losses.

Improved Livestock Production.—The improvements in production have not been confined to crops. Livestock pro-

duction has also advanced. The use of purebred sires has increased in the wheat belt. Better facilities for livestock production are available on many farms. Silos are more numerous and insure a better and more constant feed supply. (See Figs. 9 and 10.) The output of dairy products,—chiefly butterfat,—is increasing and can be expected to continue to increase slowly. The June 1, 1924, milk cow survey of the United States Department of Agriculture showed that the number of milk cows in the West North Central group of states, which includes Kansas and Nebraska, had increased 8.8 per cent during the year ending on that date. The hard winter wheat belt unquestionably has shared in this increase.

The milking of a few cows has advantages that the hard winter wheat growers are appreciating more fully as a result of their recent unfavorable price relations. These advantages of milk cows are illustrated by Table IV, showing

TABLE IV.—COST AND RETURNS IN KEEPING MILK COWS ON TWENTY McPHERSON COUNTY, KANS., FARMS, 1923*

Costs	Amount per cow	
Grain and concentrates	$13.93	
Silage and other succulent feeds	6.41	
Hay and other dry forage	18.92	
Pasture	7.04	
Man labor	20.68	
Horse work	1.27	
Use of building and equipment	4.20	
Interest on cows	4.02	
Bull service	7.06	
Miscellaneous	1.39	
Total costs		$84.92
Returns		
Dairy products	$87.05	
Calves and beef	7.04	
Manure	2.28	
Total returns		$96.37
Returns above cost		$11.45

*From farm organization investigations conducted jointly by the Bureau of Agricultural Economics of the United States Dept. of Agriculture and the Kansas Agricultural Experiment Station.

data on the cost of keeping milk cows on twenty McPherson County farms in 1923. These farms are in central Kansas. The total cost per cow was $84.92 and the returns $96.37, leaving a net return of $11.45. In addition to this net return, more than one-half of the items of cost were estimated values placed upon feeds and labor that would not have been utilized if livestock had not been available to use them. The milking of a few cows supplements the wheat grower's income without increasing his cash expenditures. The advantages illustrated by these milk cows are also shared in some degree by beef cattle, poultry, and hogs. The increased production of better adapted feed crops, shown earlier in this paper, facilitates the keeping of livestock in this region.

An increase in livestock production does not necessarily mean a reduction in wheat production. It may mean fewer acres in wheat; but crop rotation, the growing of legumes, and effective use of barnyard manure result in higher acre yields of better quality wheat. Higher yields on fewer acres may keep the bushel production of wheat near its present level. It is also significant that these higher yields are usually secured at lower costs per bushel.

Limited studies of the organization of farms in the hard winter wheat belt indicate that a farmer in this area should grow all the wheat that he can properly prepare the seed bed for and seed with his usual farm resources. To this he should add feed crops and livestock that will utilize his labor and equipment when it is not needed for wheat production. To grow wheat is the most profitable thing that he can do, but it does not occupy the entire year, so other enterprises such as feed crops and livestock are needed to supplement wheat growing and give full time employment. Consequently, wheat can be expected to continue indefinitely as the most important product of this region.

The Demand for Hard Winter Wheat.—Hard wheats of high protein content have increased in demand in recent years. The domestic milling and baking requirements now call for a "strong" flour or one that is high in protein.[8] This

[8] See page 20 of International Competition in the Production of Wheat for Export, Trade Information Bulletin No. 210, Bureau of Foreign and Domestic Commerce, of the United States Department of Commerce, for a statement of the situation and its causes.

has placed a premium on hard wheats of good quality. As a result, the hard winter and spring wheats of good quality produced east of the Rocky Mountains have been absorbed almost entirely by the domestic demand and higher prices have been paid to secure this wheat. Table V shows the situation

TABLE V.—KANSAS CITY AND LIVERPOOL PRICES OF NO. 2 HARD WHEAT, NOVEMBER, 1923.

Kansas City price of No. 2 hard wheat	$1.09
Freight rate, Kansas City to Galveston	.19
Fobbing charge	.02
Ocean rate, Galveston to Liverpool	.09
Total cost of wheat delivered in Liverpool	$1.39
Liverpool price	1.24
Amount that Kansas City price was above an export basis	$0.15

in November, 1923. No. 2 dark hard wheat was not on an export basis, but was selling for fifteen cents a bushel more than Liverpool prices would justify. Sufficient hard wheat of the desired milling quality could not be secured in the United States in 1923 and some was imported from Canada, paying the tariff, so that it might be used for domestic purposes. In brief, high protein hard winter and spring wheats have been enjoying a measure of protection under the tariff. This situation was partially wiped out early in the crop year of 1924 because of the high quality of much of the United States wheat crop and the inability of Europe to secure the usual quantities of good hard wheat from Canada. However, during recent weeks there has been a return to the domestic premium basis for No. 2 dark hard wheat.

The advantage enjoyed by the dark hard wheats is illustrated by Table VI showing the quantities of the various grades of wheat inspected for export during the year ending June 30, 1924. Hard winter and spring wheats constituted barely one-third of the wheat inspected for export during this period. About forty per cent of the hard red winter exports were from Pacific ports and consequently did not come from east of the Rocky Mountains. Furthermore, it is

TABLE VI.—UNITED STATES WHEAT INSPECTED FOR EXPORT—JULY 1, 1923, TO JUNE 30, 1924.*

Classes	Bushels
Hard Red Spring	1,022,000
Hard Red Winter	19,640,000
Durum	4,908,000
Soft Red Winter	9,810,000
White	18,653,000
Mixed	5,435,000
Total	59,468,000

*From *Crops and Markets* of the United States Department of Agriculture.

very likely that much of the hard red winter wheat exported was not of desirable domestic milling quality.[9]

The region in which wheat production has expanded grows the kind of wheat that is on a domestic basis and of which there is a deficiency. Under these conditions, why should not the wheat growers of this region grow more wheat? They have been supplying the kind of wheat of which there is too little produced in the United States and, if milling and baking requirements remain the same, these wheat growers must supply more of this kind of wheat or the United States must import it from Canada over our tariff wall.

The Present Status

These changes in the conditions of production have been enumerated and described, not to show that they have removed all the problems confronting the hard winter wheat growers, but to give a better understanding of the problem as it exists at this time. Conclusions cannot be based upon the conditions of 1913 or any other pre-war time. Further adjustment must take existing conditions as a point of departure.

[9] The situation is summarized as follows by Dr. Carl L. Alsberg in the February, 1924 issue of Baking Technology: "The proposition, then, is that, while we have at present an overproduction of wheat, we have no overproduction of high grade wheat. On the contrary we are approaching a deficiency of such wheat. For this deficiency lessened production is not responsible. Growth of population accounts for only a part of it. The increasingly insistent demand of the baker for ever stronger flour is aggravating the situation. The time is approaching when this demand can no longer be met with domestic wheat." The Coming Hard Wheat Deficiency. Carl L. Alsberg, in Baking Technology, Vol. III, No. 2. February 1924.

Conditions of Wheat Production.—The hard winter wheat belt faces these conditions which may be summarized as follows: The western portion of the hard winter wheat belt has more people on farms and more land in crops than before the war. The land that has been broken from the prairie is out of prairie grass for all time if the problem is left to private initiative. The last ten years have seen at least ten to fifteen million acres of this prairie sod broken and added to the cultivated area in this region. Wheat production has been expanded in this western country and will probably continue on a larger area than in pre-war times because of the increase in the cultivated land, improved varieties of crops and new crops better adapted to the conditions, better cultural practices, better knowledge of how to meet the hazards in crop production, improved machinery, and increased demand for the kind and quality of wheat produced in this region. Many of these changes are resulting in more economical production of wheat than was possible in pre-war times.

In the central portion of the hard winter wheat belt, the wheat acreage has been reduced probably to less than the pre-war average. In view of the need for the wheat of this area and the important place that wheat occupies in good farm organization in this region, further reductions of material consequence are not to be expected. In the eastern portion of the hard winter wheat belt, the wheat acreage has been reduced to near pre-war figures. Some wheat is needed in the rotations of this region and continued production of approximately the present acreage is to be expected. In the western and central portions of the hard winter wheat belt, and to a lesser degree in the eastern portion, more economical wheat production than in pre-war times is possible, thanks to the improvements enumerated.

Debts.—There still remains the debt situation to consider. Census data are the best available on mortgage debts, but they have the limitation of being five years old. However, the wheat growers have not been in a position to pay off mortgages since 1920 until during the past six months, when some farmers have been able to pay something on their debts.

TABLE VII.—MORTGAGE DEBTS OF KANSAS FARMERS, 1910 AND 1920.

(Data from United States Census reports.)

	Eastern Kansas		Central Kansas		Western Kansas	
	1920	1910	1920	1910	1920	1910
No. of farms:						
Free from mortgage debt	21,903	26,347	14,438	23,280	4,638	10,935
With mortgage debt	21,046	25,299	15,869	17,465	7,149	6,485
No. of farms reporting amount of mortgage debt	15,073	17,231	8,665	10,152	3,185	3,059
Total mortgage debt reported	$59,291,731	$40,498,452	$39,611,888	$25,374,366	$11,010,845	$4,946,918
Mortgage debt per farm reporting	$3,934	$2,350	$4,571	$2,499	$3,457	$1,617
Debt per farm in per cent of 1910	167	100	183	100	214	100
Value of land and buildings per farm reporting amount of mortgage debt	$14,422	$8,371	$18,379	$11,352	$15,018	$9,018
Ratio of debt to value	27.3%	28.1%	24.8%	22.0%	23.0%	17.9%

Consequently, census data should indicate fairly closely the extent of the mortgage debt at present and if any change has occurred it probably would be in the nature of increases in such debts. Table VII shows the farms with mortgage debts in 1910 and 1920 and the amount of the debt in the various sections of Kansas. The proportion of the farms mortgaged increased materially in western Kansas, less in central Kansas, and remained approximately stationary in eastern Kansas. The debt per farm increased in the same order, being least in eastern Kansas and greatest in western Kansas.

Changes in the tenancy situation have also contributed to the changed situation in the winter wheat belt. Table VIII shows the number of farms, the number of tenants, and the per cent of all farms operated by tenants in 1910 and 1920.

TABLE VIII.—TOTAL NUMBER OF FARMS AND NUMBER OF FARMS OPERATED BY TENANTS IN THE VARIOUS SECTIONS OF KANSAS, 1910 AND 1920.

	Eastern Kansas		Central Kansas		Western Kansas	
	1920	1910	1920	1910	1920	1910
No. of farms -----	79,208	86,482	64,847	68,563	21,231	22,796
No. of farms operated by tenants	30,253	33,449	28,834	26,899	7,614	5,050
Per cent of farms operated by tenants ----------	38.2	38.6	44.5	39.2	35.9	22.2

In eastern Kansas the per cent of tenancy decreased slightly, in central Kansas it increased, while in western Kansas the increase was much more pronounced. This means that a larger proportion of the wheat farmers of the winter wheat belt are tenants than in 1910. Furthermore, during the war these tenants purchased equipment to use instead of hiring high priced labor and it is probable that much of this equipment was purchased with borrowed funds. Many tenants, having no investment in land to fall back upon, soon found their equities in farm property wiped out in the price decline of 1920. The increase in the investment in machinery from 1910 to 1920 is indicated in Table IX. This table also shows the increase in other farm property. Comparison with the preceding table on debts shows that debts of owners in west-

TABLE IX.—TOTAL AREA, IMPROVED AREA AND VALUES OF FARM PROPERTY IN THE VARIOUS SECTIONS OF KANSAS, 1910 TO 1920.

(From United States Census.)

	Eastern Kansas		Central Kansas		Western Kansas	
	1920	1910	1920	1910	1920	1910
Total area per farm (acres)	181.6	172.5	269.5	253.4	639.0	486.6
Improved area per farm (acres)	123.1	125.5	205.1	194.8	355.4	250.0
Value of land in farms per farm	$12,985	$7,235	$17,213	$10,698	$15,587	$7,843
Value of buildings per farm	2,199	1,175	2,148	1,162	1,931	802
Value of implements and machinery per farm	793	213	1,097	338	980	292
Ratio of values in 1920 to 1910:						
Land per farm	179.4	100	160.9	100	198.7	100
Buildings per farm	187.1	100	184.8	100	240.8	100
Implements and machinery per farm	372.3	100	324.6	100	335.6	100

ern Kansas increased more rapidly than values as shown by the census. The increase in the number of tenants and in the machinery per farm would indicate that the distress of tenants was a material part of the total distress in this region since 1920.

The situation of many of the farmers of the hard winter wheat belt is such that it might be likened to a merchant who has purchased a business that is fairly profitable on the basis of current values but who is in financial distress because he paid more for the business than it proved to be worth. The problem of working off the debt will exist even after the business in on a thriving basis. So with the wheat growers, the problem of debt payment will still exist even though adjustments were to be completed within the near future. Payment of these debts will probably be a slow process and their burden can be borne easiest if they are refunded into long time paper with gradual amortization of the principal.

This discussion has dealt chiefly with those problems that are internal to the farm business. There are still other problems which involve marketing, cooperation, credit, transportation, taxation, and so on, but time does not permit their discussion. However, it is the belief of the writer that the changes under the control of the individual farmers are the most fundamental since much of the ultimate solution of the problems of adjustment is dependent upon their individual action. Consequently, recommendations for the aid of these people must be acceptable to them so that they will act upon them. In the final analysis agricultural adjustment is a human problem and intensely so. It is a problem of helping these farmers to remedy the mistakes of the past and to restore their business to a paying basis. The preceding discussion indicates the avenues through which aid may be most fruitfully rendered.

Conclusions

The following are the lines of effort along which the writer believes aid can be rendered most fruitfully:

1. Encourage adjustment of the wheat acreage per farm in the central and western portion of the hard winter wheat belt to the area that can be seeded properly and in the right

kind of a seed bed with the usual labor force and equipment of the farm.

2. Encourage the production of the high protein dark hard wheat that is now on a domestic market basis and for which millers are paying premiums in terminal markets.

3. Aid in securing for the wheat grower the premiums paid for high quality wheat. At present the grower does not always secure the premium which his wheat deserves.

4. Encourage sound cooperative action by farmers in the marketing of their products. The farmer appreciates his weakness as a bargainer in the market and has looked toward cooperative action to remedy this weakness. The individual farmer needs adequate information and direction on cooperative schemes so that he may be protected from uninformed though often well-meaning promoters of unsound plans for cooperative action.

5. Encourage wider adoption of improved varieties of crops and improved cultural practices so that more farms may enjoy the advantages of more economical and efficient crop production.

6. Encourage the keeping of livestock on the wheat farm to the extent that such livestock can utilize the unemployed labor and the bulky feeds and by-products of the farm as well as limited areas of feed crops grown for the livestock.

7. Encourage education that will acquaint the farmer with improved methods and practices and also keep him informed concerning the demands of the market. Adequate market news service is essential for this purpose.

8. Encourage research work so that it may reveal further possible improvements in agricultural production and marketing.

9. Encourage refunding of farm debts into long-term paper and providing ways for gradually retiring the principal of these debts.

In accomplishing these things it is believed that the safest and wisest policy is to give the farmers the fullest possible opportunity to help themselves.

DISCUSSION BY REX E. WILLARD

NORTH DAKOTA AGRICULTURAL COLLEGE

In discussing the general wheat situation, we find the position of the American farmer in general to be rather unfavorable. With a general exportable surplus of upwards of 30 per cent and the lower costs possible in production in foreign countries, there can be no doubt that American production must be conducted on the lowest possible margin in competition with other countries. There are undoubtedly large areas in foreign countries awaiting further expansion of the industry whenever the price will justify it. Argentina can increase her present wheat area probably five or ten times. Canada has millions of acres of virgin land, which is potential wheat area. The slump of Russian export has been entirely overcome by production in other countries. Australia may increase her wheat acreage somewhat.

In general then, there is little opportunity for wheat expansion in the United States (there being no more new land) unless the present margin between cost and income can be still further narrowed and still leave a profit. In other words, on the long-time basis, there is likely to be plenty of wheat to supply the world demand and, consequently, production will be made on a very narrow margin of profit. The favorable situation of the crop of 1924 in the United States, with prices soaring to levels unheard of except during war and post-war inflation, can be ascribed to nothing but an accident of Providence and the inexorable working of the law of supply and demand. That Canada, Argentina, and other competing foreign countries will all have another short crop, all in the same year, and the United States be favored with a large crop at the same time, would appear to be nothing short of a miracle. It is more likely that the farm price of wheat for the 1925 crop in the United States will be nearer 70 cents than $1.35.

Various sections of the United States are favored over other sections in being able to produce the crop at lower costs per unit, and in these sections farmers can more successfully compete in the production of the crop. Again, there are sections where the crop fits well into the farming system from the standpoint of crop rotation and labor distribution, which add to the ability of those farmers to compete in the general scheme of production.

It is well to think of wheat in the United States on the basis of four commodities for certain considerations, these commodities being determined largely on the basis of utilization of the products. These are: (1) soft winter wheat, (2) hard winter wheat, (3) hard spring wheat, and (4) durum wheat.

Consider for a few moments hard spring wheat. Its area of production in this country is western Minnesota, northern South Dakota, North Dakota, and parts of Montana. This wheat is generally of high gluten content (12 to 16 per cent) and is in great demand by the

millers for mixing with the softer wheats of lower gluten content. Because of this demand, there is usually offered a premium for this wheat, especially where the quality is good. In North Dakota, where the largest portion of hard spring wheat is raised in this country, the average yield per acre varies from county to county from 8 bushels to 13.5 bushels per acre. In Kansas, where hard winter wheat competes with hard spring wheat for quality, the yield is nearer 18 bushels per acre. Since yield is the largest single factor affecting cost per bushel, this one factor indicates a lower cost of 25 cents or more in Kansas as compared to North Dakota. If the quality of the two products is nearly the same, this difference in cost will prevent much expansion in North Dakota, if profits are to be made. Furthermore, North Dakota is just passing out of the pioneer into the permanent, stable type of farming. This means less extensive farming and the production of crops other than grain. Relatively, this has been the trend since the early nineties, although actually the total acreage of wheat has increased from 2.5 million to 9.5 million acres of wheat, due to the settlement of new land largely. In the early nineties, wheat occupied 70 per cent of the then crop land. Today it occupies less than 50 per cent of the crop land. Since there is no more new land on which to speculate with wheat, there will be no further general increase of wheat acreage on virgin soil. The present wheat acreage of the state cannot compete with other parts of the United States in general wheat production, nor can it compete with Canada in the production of hard spring wheat, where the yields are 50 per cent or 75 per cent higher, tariff or no tariff.

The tendency of production has, with temporary variations from time to time, been away from wheat in North Dakota since the first crops were produced. State yields have been reduced latterly, due chiefly to the bringing in of land less adapted to the production of this crop. Weeds and other physical difficulties are serious troubles of the present. The substitution of forage and inter-tilled crops is taking place and this has been going on consistently though slowly with minor variations for two decades. While wheat production will remain the important enterprise on North Dakota farms for many years, all investigations point to a more satisfactory system of agriculture where greater diversification is practiced.

It is to be hoped that North Dakota and the spring wheat area will not be deceived by the accidental wheat situation of 1924 and let the relatively high temporary prices wield too great an influence in the spring planting of 1925. From the standpoint of competition of other regions, the stability of farming, and the economic organization and operation of the farms in North Dakota, this state can scarcely profit on the long-time basis by an expansion of her present wheat acreage.

WHEAT AND FLAX IN THE NORTHWEST[1]

ALVA H. BENTON AND REX E. WILLARD
NORTH DAKOTA AGRICULTURAL COLLEGE

Flax has an important place in the agricultural readjustment program of the hard spring wheat area of northern Minnesota, the Dakotas, and Montana, but flax should not be used as a substitute for wheat on a large scale. Low yields, due largely to weeds and unfavorable soil conditions resulting from continued grain production, coupled with relatively low prices over a series of years, has made a change necessary in the cropping system. The change should be, however, from wheat to inter-tilled or forage crops rather than to another small grain such as flax. There are several limiting factors that have been overlooked by some in suggesting the advisability of replacing wheat with the apparently more profitable flax crop. It is to this phase of agricultural readjustment that your attention is directed in this paper. Some flax history and a few facts relating to the production and marketing of flax will be presented as a background.

Flax production was undertaken in the United States soon after the landing of the Pilgrims in Massachusetts in 1620, and it was grown until the middle of the 19th century in the eastern states, largely as a fibre crop. In 1850, Ohio and Kentucky were the heavy flaxseed producing states, and since that time the flax area has steadily moved westward through Indiana, Illinois, Wisconsin, Minnesota, and Iowa. Today the heavy flaxseed producing area is centered in North Dakota, South Dakota, Minnesota, and Montana. These four states produce over 90 per cent of the crop in the United States. Government crop reports indicate a small seed production in Wisconsin, Nebraska, Kansas, and Wyoming.

PRODUCTION AND YIELD OF FLAXSEED.—With the exception of the 1924 crop the maximum production of flax in the United States occurred in 1902, when 3,740,000 acres were reported, with a yield of 29,285,000 bushels. From 1914 to

[1] This paper was read at the Fifteenth Annual Meeting of the American Farm Economic Association, held in Chicago, December 31, 1924.

1922 the acreage was under 2,000,000 acres and the production under 15,000,000 bushels, and even fell to 1,503,000 acres in 1919, with a yield of 7,256,000 bushels. The 1923 flax acreage as compared to 1922 increased nearly 100 per cent and the 1924 acreage increased 63 per cent over the 1923 acreage. (See Table I) North Dakota normally produces about 50 per cent of the United States crop of flaxseed.

TABLE I.

FLAX ACREAGE AND PRODUCTION, 1920-1924.

	U. S. Acreage	U. S. Production Bus.	No. Dak. Acreage	No. Dak. Production Bus.
1920	1,757,000	10,774,000	761,000	4,033,000
1921	1,108,000	8,029,000	430,000	2,795,000
1922	1,113,000	10,375,000	521,000	4,845,000
1923	2,014,000	17,060,000	1,050,000	8,085,000
1924	3,289,000	30,173,000	1,732,000	14,722,000

The chief competitors of the United States in the production of flaxseed are India and Argentina. India has shown increases in acreage of flax from 1920 to 1923, while the acreage in Argentina has fluctuated. The world acreage of seed flax for 1923 is estimated by the Department of Agriculture at 12,273,000 acres. The United States with 2,061,000 acres, therefore, had approximately one-sixth of the acreage of the world in 1923 and probably about one-fourth in 1924.

FLAX WILT.—Until recent years flax has been considered a "pioneer" crop and has been largely grown on new land. It was found that flax did not thrive after being grown successively for a few years on the same land. This condition was attributed to various causes, as depletion of soil fertility and "flax sick" soils. Before 1900 Prof. H. L. Bolley, Plant Pathologist of the North Dakota Agricultural College, began a study of flax diseases and discovered that flax sick soils were the result of fungus diseases or wilts, which developed in the soil and were carried from place to place both on the seeds and on the flax plant. By careful selection he secured strains that are markedly resistant to fungus diseases, and as a result

of his work varieties have been developed that are the base of the flaxseed industry today. One of the very best is known as North Dakota Resistant 114. The use of disease resistant varieties has again made flax a profitable crop in old farming areas where for years it had scarcely been seen. Since the price of flax has been relatively higher the past few years than other grain crops, the acreage has increased very largely, as the resistant strains could be depended upon for reasonably good yields.

The disease resistant strains do not give as heavy yields as some of the larger seeded varieties when the latter are grown on disease free soil. Flax breeding and selection work has a number of goals. Some of these are the combination of resistance to wilt, rust, and other diseases, with heavy seeding characteristics, high oil content of seed, and a sturdy rooting system as a factor in drought resistance. It is well to note that in recent years since the introduction of disease resistant varieties the prevalence of weeds has been a greater factor in reduction of yield than disease. Flax is a delicate shallow-rooted plant that wages a losing fight with the weeds most common in grain fields.

FLAX IN THE CROPPING SYSTEM.—In the earliest days of settlement of the Northwest the seeding of flax as the first crop after breaking the prairie sod was recognized as good practice. The sequence of flax after corn and fallow land seems to be the next best practice. Following these in desirability comes the sequence of flax after potatoes. West of the 100th meridian, however, fairly good results are obtained by the seeding of flax on spring plowing. East of the 100th meridian, which passes through the central part of the Dakotas, it is of considerable importance that the flax crop be seeded early rather than late in the spring, as has been the common practice. In eastern North Dakota, eastern South Dakota, and Minnesota flax should probably not be seeded later than May 15. In the western portion of the flax producing area Russian thistle may be a menace, in which case it may be desirable to seed flax a little later. The practice of seeding flax with wheat on the same land is being tried with some prospect of favorable results.

Flax production in regions where it is adapted would seem to be a wise procedure in the organization of some forms, but care should be exercised that its production is not overdone.

MARKETS FOR FLAXSEED.—The demand for flaxseed is the result of the demand for the oil of the seed, namely, linseed oil. This is the most satisfactory oil yet found for the mixing of paints and varnishes. Approximately 65 per cent of the consumption in the United States is by paint and varnish manufacturers and 25 per cent by the linoleum industry. It is also used in the manufacture of printers' ink, patent leathers, and waterproofing materials. A bushel of flaxseed produces about 2½ gallons or 19 pounds of oil and 37 pounds of linseed cake. The cake is a valuable stock food, and about 500,000,000 pounds, valued at $10,000,000, are exported annually. The market for flax straw is increasing, and it finds an outlet among manufacturers of rugs, matting, toweling, insulation boards, and building paper.

The census of 1920 reports 26 flax seed crushing plants in the United States. The three states having the largest number of plants are New York and Minnesota with six each, and Ohio with three. The Minnesota crushers are dependent largely on the seed raised in the spring wheat area. The Atlantic Coast mills have been depending largely on seed imported from Argentina. The number of crushing establishments declined from 81 in 1879 to 26 in 1919. The size of business has been increased, and the last census reports 22 establishments with an annual business of over one million dollars each. Ranked according to value of products, New York stands first and Minnesota second. Some crushing is done in Superior, Milwaukee, and Chicago. It is worthy of note that the majority of the crushers have either been located close to the flax producing areas or at points where cheap water transportation is available.

FLAX AND THE TARIFF.—Since 1909 the United States has been importing flax in considerable amounts, and the tariff has had a direct bearing both in the price the farmer receives and on the flax crushing industry. With a surplus of over four million bushels in the United States in 1907 the average farm price was 95 cents a bushel. One year later, when pro-

duction about supplied the domestic needs, the price was $1.18 a bushel. Two years later when nearly five million bushels were imported the price was $1.53 a bushel.

By the Underwood Tariff the duty was 10 cents a gallon on linseed oil, or the equivalent of 25 cents a bushel, and 20 cents a bushel on flaxseed. With certain drawback privileges relating to the export of oil cake and meal, relatively small amounts of linseed oil were imported and the domestic crushers operated normally. Under the Emergency Tariff Act, which went into effect in May, 1921, the duty on flax was raised to 30 cents a bushel, but linseed oil was left unchanged, remaining at 10 cents per gallon or the equivalent of 25 cents a bushel. This resulted in large imports of oil, reduction in imports of seed, and part time operation of many crushers. The McCumber-Fordney Tariff Act which went into effect in June, 1922, increased the duty on linseed oil to 3.3 cents per pound, or the equivalent of about 62 cents per bushel. Since that time imports of oil have been relatively small and the crushers have been operating normally. During the calendar year 1921, when the Emergency Tariff Act was in effect, in round numbers 14 million bushels of flaxseed were imported and the equivalent of 8 million bushels as oil. In 1923, after the passage of the McCumber-Fordney Tariff Act, 23 million bushels of flaxseed were imported and the equivalent of less than 2 million bushels as oil.

Under present conditions the farmer gets only about 30 cents benefit from the 40-cent tariff on flax, as there is a drawback privilege equivalent to 10 cents when oil cake is exported. The Federal Tariff Commission has already held a hearing on vegetable oils, thereby bringing linseed oil into consideration. Users of vegetable oils are petitioning to have the tariff reduced, while flax growers are asking for an increase in the tariff on flaxseed to 60 cents per bushel. Crushers of the flaxseed state that they favor a tariff on oil that will reduce imports to a low figure and a tariff on seed sufficient to stimulate production to the point of supplying the domestic plants with the bulk of the seed they grind.

FLAX AS A FACTOR IN REDUCING THE WHEAT ACREAGE.—A limited increase in the acreage of flax in the hard spring wheat area of the Dakotas, Montana, and Minnesota will help establish a better balanced system of farming. The profit or loss per acre on flax and wheat for a number of farms in North Dakota for the years 1921, 1922, 1923, and 1924 are shown in Table II.

TABLE II.

PROFIT AND LOSS PER ACRE ON FLAX AND WHEAT.*

North Dakota—1921, 1922, 1923, 1924.

	1921		1922		1923		1924	
	Flax	Wheat	Flax	Wheat	Flax	Wheat	Flax	Wheat
Acre yield in bus..	6.7	9.85	9.5	13.5	7.7	8.2	9.8	15.3
Acre cost	$16.78	$14.09	$16.25	$13.84	$16.32	$12.23	$14.58	$12.34
Acre value	9.58	10.54	20.33	12.15	16.32	7.38	22.54	19.74
Profit or loss	−7.20	−3.55	4.08	−1.69	0.00	−4.85	7.96	7.40

*Data from Farm Management Department, North Dakota Agricultural College.

Compared to wheat in the spring wheat area, flax was less profitable than wheat in 1921, but more profitable in 1922 and 1923 and about equally profitable in 1924. There are several reasons, however, why flax should not take the place of wheat to any large extent:

(1) There is a quite limited market for flaxseed in the United States at present prices. According to the best data available the commercial and seed requirements for flaxseed in the United States during the coming year may reach 45 million bushels. Linseed oil manufacturers state that if much more than 80 per cent of this amount, or 36 million bushels, is produced in the United States the price will likely be depressed or, in other words, the tariff will cease to have its present influence in maintaining prices. If business conditions should slow up, a smaller production will depress prices. If the 1925 flax acreage is increased one-third over the 1924 acreage and yields equal to the average of the last five years are secured, the total production of flax will reach the 36 million bushel mark set as the maximum beyond which prices are likely to be depressed. Flax production in 1924 plus im-

ports from July 1 to December 31, 1924, amounted to 35,297,-033 bushels. The estimated 1924 acreage of spring wheat in North Dakota, South Dakota, Montana, and Minnesota, is 13,900,000 acres. Ten per cent of this wheat acreage added to the flax acreage of 1924 would result, on the basis of a five-year yield, in more than 36 million bushels of flax. At the same time such a reduction in the acreage of wheat would be almost, if not entirely, unnoticed on the wheat market.

(2) Even if there were prospects of present prices being maintained with a much larger production of flaxseed, any large increase in the acreage of flax as a substitute for wheat would call land into use that is unsuitable for this crop and would result in low yields for many farmers, with attendant losses. This tendency was already evident on many farms both in 1923 and 1924, even with unusually favorable seasons. As already noted, flax wages a losing fight with weeds, and the seeding of flax is an unprofitable venture unless the land is clean and well prepared. This means that there is a relatively small amount of wheat land that is in condition for flax, even if there were a market for a much larger amount of flaxseed.

(3) If flax production should assume the proportion of an export crop the price of flaxseed will drop very decidedly. When the mills in the United States find the home supply of flaxseed more than sufficient to meet their needs, the flax grown in the spring wheat area must compete at the Atlantic seaboard with flax from Argentina on the basis of world price. This means a 30-cent reduction in the price of flax now resulting from the tariff, and also the transportation charges from Minneapolis to the Atlantic seaboard. By rail and lake this will amount to at least 20 cents per bushel. These two factors can thus be counted upon to reduce the farm price at least 50 cents a bushel, and this will place flax production in the class of unprofitable farm enterprises or at least less profitable than wheat.

AGRICULTURAL READJUSTMENT IN THE CORN BELT[1]

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Thought and discussion as to the solution of the farmers' problem has passed through many phases since the crisis of 1920. Price fixing, credit, the tariff, and cooperation have each in turn been suggested as the all-important remedy. It is significant that our program for this meeting as a whole indicates a recognition of the true fundamental nature of the problem, the necessity of a thorough-going examination of it, and a well-reasoned treatment. Not only the agricultural economists but farmers themselves are realizing that a hasty cure is not to be expected. With this realization has come the conviction that the task of readjustment as a means of getting our agriculture back to a prosperous condition is a task fraught with great difficulties. However, this realization is the most encouraging phase of the whole situation. It has carried us beyond the hopes of a quick and spectacular solution by some easily applied formula and has put us well in the way of working out, detail by detail, the problem as it actually is.

In attempting such a difficult task as that of outlining a possible program of agricultural readjustment in the Corn Belt, one realizes that in the limited time allotted little can be done beyond pointing out some specific maladjustments, some of the factors in the situation which limit and condition the readjustment process, and giving, if possible, some positive suggestion as to a successful attack on this great task at this point.[2] In undertaking this treatment, we wish (1) to review briefly some of the elements in the situation which have given

[1] This paper was read at the Fifteenth Annual Meeting of the American Farm Economic Association, held in Chicago, December 31, 1924.

[2] It is perhaps well to say that the term Corn Belt as used in this paper is applied to the whole region to which it is popularly applied, instead of being restricted to the comparatively limited area in which a very high percentage of the farm land is in corn and from which the maximum yields are secured. It includes a considerable area in which a large amount of permanent pasture and hay land is to be found and in which, because of limitations as to soil and surface, the corn crop itself does not reach maximum proportions. As thus delimited it includes the States of Ohio, Indiana, Illinois, Iowa, Missouri, and those portions of South Dakota, Nebraska, Kansas, and Kentucky in which the production of corn and of meat animals occupies an important place in the farm system.

us this problem of readjustment, (2) to discuss the readjustment problem as it faces the Corn Belt farmer and his advisers in the immediate future, and (3) to point out some of the considerations to be kept in mind in view of the long-time adjustment and the development of a permanent agricultural policy and program for the region.

I. The Occasion for Readjustment

In order to get specifically before us the problem of maladjustment with which the Corn Belt farmer is faced, it is necessary to point out several effects of the war with its accompanying inflation and deflation of prices.

The first and probably the most important consideration, at least from the short-time point of view, is the scale of production which has been maintained through this critical period. Has the Corn Belt farmer been able to gauge his production in view of the changing demand for his products? In examining the facts in this connection we have reduced the statistics to relatives. These data are presented in Figure I. In the upper chart of this figure, ten commodities of outstanding importance in this general area have been worked into a weighted average by Day's method to give us an annual physical production index. These commodities are corn, oats, winter wheat, beef, veal, lamb and mutton, pork, eggs, butter, and wool. It will be noted that while there has been a considerable amount of seasonal fluctuation due primarily to changes in crop yields, the general tendency has been consistently upward as indicated by the smoothed curve drawn through the line representing these indices. For purposes of comparison Day's "Index of Physical Productivity of Agriculture" has been converted to the same base and plotted here. This latter index, it should be said, is based alone on crop products and excludes all animal products. The extreme drop noted between 1920 and 1921 is primarily due to a reduction of almost 50 per cent in cotton production and a very substantial reduction in the potato crop of 1921. If the products of the small grain area, for example, were plotted separately they would likewise show a generally upward trend. This increase

in production over the base period of 1909 to 1913 for these Corn Belt commodities as a whole is almost 30 per cent as represented by the yields of 1923 and 1924. It is interesting in this connection to cite the case of certain specific commodities. We find, for example, that for the more important

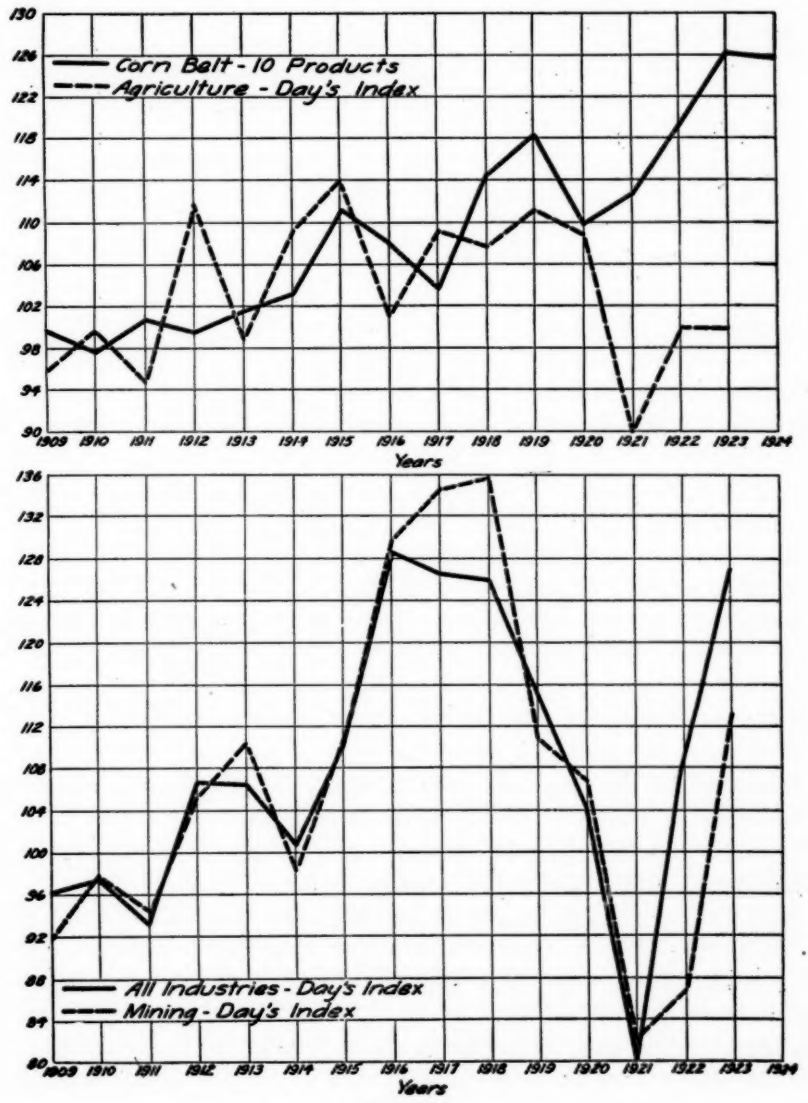

FIGURE I

Corn Belt grains the increase in production has been only moderate. For 1923 the corn index stands at 112.6, the oats index at 113.7, while the winter wheat index is 131.5. As to livestock products the only important increase is in swine. The index for beef cattle stands for this same year at 107.6, wool at 84.7, while pork stands at 160.8. The indices for eggs and butter stand at 131.9 and 132.4 respectively. For the current year the estimated index shows outstanding changes only in the case of corn and oats. Corn has dropped back to 91.4, while oats have risen to 130.1.

These index figures have been based on quantity of production and not on acreage. Examining the crop acreage of oats and corn, the two outstanding crop products of the Corn Belt, we find that for the United States as a whole there has been an increase of only 1 per cent in the corn acreage as represented by the estimated acreage of 1924, whereas for the nine Corn Belt states considered in this paper there has been an actual reduction at 2 per cent. So far then as corn figures in the expansion of physical production, it is due not to a deliberate intention on the part of the farmers to expand, but to an unusual succession of abnormally large crops due to unusually favorable weather conditions. In the case of oats, increase in acreages above the base period was realized in 1918, when it rose 20 per cent above normal. For the current year the oats acreage is 13 per cent above the average for the base period. The really significant increases in production, therefore, are to be found in the livestock enterprises. It is probably true that the very substantial increase to be noted in beef and pork products has been stimulated for the most part by the unusual production of corn. This has been particularly effective in the case of hogs which, as we have seen, showed for 1923 an increase of 60.8 per cent above the average production for the base period.

A striking contrast in the ability to gauge output to economic conditions as between agriculture and industry is afforded by a comparison of the agricultural indices in the upper chart with those of industry and mining in the lower portion of Figure I. It will be noted here that during the war and immediate post-war period from 1915 to 1920 there was a

tremendous expansion in physical output; that with the depression beginning with the crisis of 1920 there was a remarkable curtailment of production; and that subsequently, with more favorable conditions, production again sprang upward to a remarkable degree. This comparison points in the direction of a fundamental difficulty in agricultural readjustment, the basis of which we cannot adequately discuss here. It is perhaps sufficient to point out that the farmer, with his very high percentage of costs in the nature of fixed charges occasioned by investment in land, productive livestock, and long-time equipment, and operating a very limited business, finds it practically impossible to curtail his production in times of depression. To do so would mean a greater loss than to continue production, even though the collective effect is most disastrous.

To summarize the situation with reference to volume of production, we may say that the present finds the Corn Belt farmer with the volume of his business at least as great as it was during the flush of the boom period, that the succession of seasons unusually favorable to high corn yields has induced an abnormal expansion in the production of hogs which have been a burden to the market and for which the short crop of the current season provides an altogether inadequate support in the way of feed. It finds him with the beef enterprise in a most uncertain state in which the spread between the price of stockers and feeders and that of finished beef, even with finished cattle selling at a relatively low price, is great enough to make fattening profitable under normal conditions, but which a short corn crop and consequent high prices makes questionable. It further finds him with a market for dairy products in so uncertain a position as to make it doubtful wisdom further to expand that alternative enterprise. The experiences of the last ten years have indicated on the whole that there is but little elasticity in crop production, except as the result of weather conditions and other things outside the control of the farmer. All of the points of flexibility in the normal Corn Belt system of farming are to be found in crop utilization rather than crop production. It is possible to expand and contract the volume of hog production; it is also

possible to feed fewer or more beef cattle. However, the inflexibility of the cropping program has its effect upon the livestock phases of Corn Belt farming, and makes on the whole a situation difficult to handle.

The next factor to be considered in the Corn Belt situation is that of market conditions. When we raise the question of the extent of dependence of the Corn Belt upon a foreign market, we find that only in the case of one product, pork, is this dependence great enough to be a serious factor. However, since hog raising is so large a part of Corn Belt farming and such a large percentage of the total volume of hog products is dependent upon a foreign market, the condition of that market is a matter of very serious concern. During the period 1909 to 1913 we exported an average of three per cent of our beef production, 13 per cent of our hog products, 1.5 per cent of our corn and only .7 of one per cent of our oats. The percentage of oats exported rose markedly during the war, but since the base is so small this expansion is of comparatively little significance. More significant to the Corn Belt farmer is the percentage of beef and pork exported. The maximum sales of beef abroad was reached in 1917 when 7.9 per cent of our total recorded production of beef and beef products was sent abroad. The peak in pork export was reached in 1918 when we sent out 30.5 per cent of our total product. Sharp declines came subsequently in our exports of both these products so that in 1923 we exported only 1.5 per cent of our beef. Pork product exports have remained near 20 per cent, however, until last year, when they fell to 11 per cent.

It is obvious, of course, that the total or relative amount sent abroad is of only secondary importance as a reflection of the purchasing power of the foreign market and the effect which declines in this purchasing power have had upon the domestic price of these products and thus upon the economic well-being of our producers. With an uncurtailed production it was necessary to dump the surplus upon the foreign market at whatever price it would bring and any general reduction in the urgency of demand has had a depressing effect upon the prices at which the whole product could be sold. The pur-

chasing power of Europe is one of the fundamental facts to be faced in a study of the present problem. The Corn Belt farmer is vitally interested in everything influencing the rehabilitation of Europe, particularly on the industrial side.

We turn next to a consideration of the effect of expanded

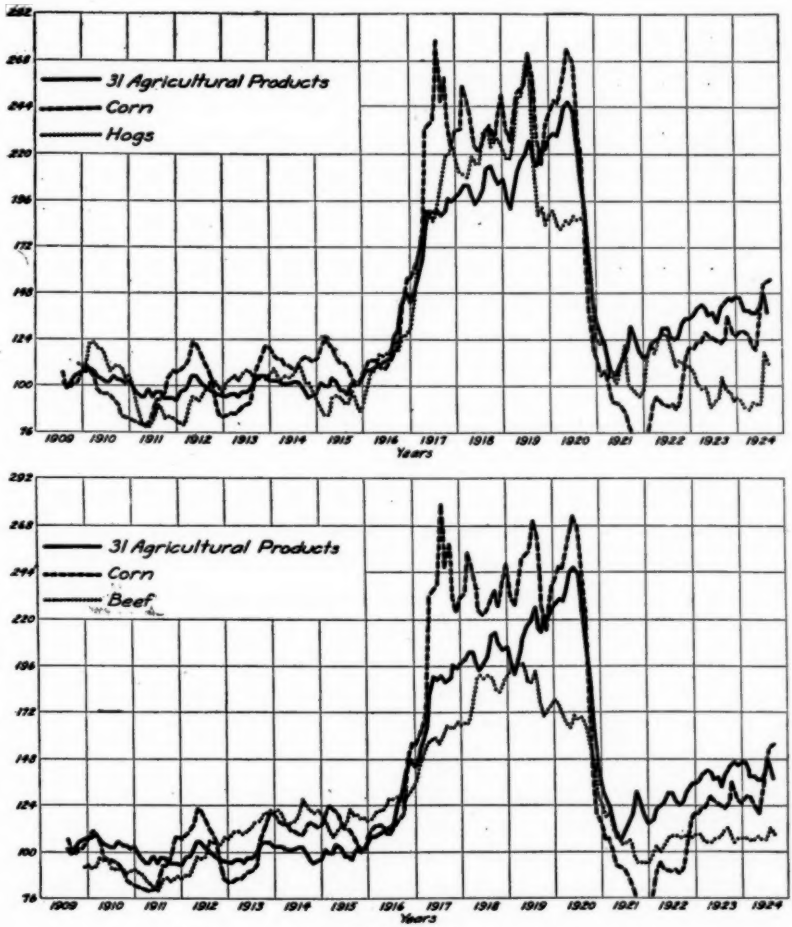

FIGURE II

production and curtailment of demand upon the prices of the leading Corn Belt products. Figure II presents the changes in the prices of corn, beef, and hog products as compared with a weighted average of 31 agricultural commodities for the

country as a whole. These curves are based upon Professor Warren's series of monthly price indices. The most obvious thing shown by these charts is that Corn Belt products fell very much below the average of all agricultural products in the depression and that they have for the most part remained below the general agricultural price level. It should, of course, be noted in this connection that the general agricultural price level has been influenced greatly by the inclusion of cotton, for which the price has been high, owing to the scarcity induced by the ravages of the boll weevil. It is also influenced by the inclusion of dairy products, for which the prices have remained relatively high during the depression. Examining these charts still further to get the relation between the prices of the several Corn Belt products, we find that for the years 1920, 1921, and 1922 corn prices were for the most part well below the level of livestock prices, but for 1923 and 1924 livestock prices have dropped below the price of corn. In this we find the natural effect of a continued increase in the livestock industry in order to take care of the oversupply of feeds coupled with the low corn yields of this year, and we find ourselves faced with high feed prices and relatively low livestock prices. The more significant fact, however, is not the present relation between the prices of feeds and of livestock, but the position of final Corn Belt commodities, meat and meat products, in the general market. It must be said that in spite of the gratifying recovery of the last two years, this position is not yet strong. There are certain elements of strength in it and there seems to be every reason to believe that in the course of a few years the more slowly acting forces of population growth and industrial development at home and abroad will restore Corn Belt prices to the strong position they held before the war. For the immediate future, however, we may expect a continuance of unstable and on the whole unsatisfactory market conditions.

Still another aspect of the maladjustment in Corn Belt farming brought on by the war is the matter of costs. One of the prominent characteristics of farming costs, which finds its extreme exemplification in the Corn Belt, is the high proportion of fixed to variable expenses already mentioned. By

far the largest item in the farmer's fixed charges is the allowance upon the investment in farm land. One of the most striking effects of the boom period was the increase in the value of farm lands. An investigation in Iowa shows that up to 1921 there had been an increase in land values, as based on actual sales, of approximately 140 per cent over the average value for the period 1909 to 1913. This investigation was located in an area where land selling was particularly active. However, throughout the whole Corn Belt there was a very sharp rise in land values. It will, of course, be argued that, since these expanded values have shrunk during the depression, the fixed charges from this source need not necessarily represent a permanent addition to costs. Some might go farther and say that the capitalization of fixed assets carried from one economic period into another has no cost significance at all since they do not condition production. If these resources are supra-marginal they will be used anyway. It is true that practically all Corn Belt land is supra-marginal even in this low-price period and that its high capitalization must in the long run take the shock in the adjustment without checking production, but this does not prevent the matter from being of vital importance from the point of view of entrepreneural costs. Further, when one realizes that a large amount of land—estimated at 10 per cent for the State of Iowa—changed hands during the years of the boom and that for the most part this land was bought by actual farmers and upon deferred payments, we can easily see that actual obligations in the form of interest make a very large and significant figure in the annual costs of Corn Belt farming. Further, there were other items of long-time investment such as equipment and buildings which to a considerable extent were made on the basis of deferred payments and thus figure in the actual costs of farm production. Likewise, the variable expense as represented by labor, machinery, fertilizer, and other items of operating expense are at a distinctly higher level relatively to prices than they were in the pre-war period. The cost situation on the whole represents to a marked degree the projection of the high costs of a period of expansion over into the low-price conditions of a period of depression.

To summarize the elements of maladjustment and hence the occasion for readjustment in Corn Belt agriculture, we have pointed out, first, that the volume of physical production, instead of being curtailed as was done in the case of general industry, has shown on the whole a steady expansion, this expansion taking place particularly in the livestock enterprises, being most aggravated in the case of hogs; secondly, the market demand for this expanded amount of production has been greatly weakened on account of economic conditions, particularly with reference to the European market, which developed as a result of the war; third, as an outcome of these two conditions the prices of Corn Belt products have on the whole fallen even below the general agricultural price level; and fourth, the Corn Belt farmer's costs, which were greatly expanded as a result of the developments of the boom, have been carried over with all too little contraction into the low price period in which he is now laboring. In addition to the conditions just outlined, we find ourselves with practically the old alignment of farm enterprises and with the old methods of production practically unchanged.

II. The Immediate Problem of Adjustment

Having before us an outline of the situation of Corn Belt agriculture as it stands at the beginning of the fifth year after its fall from the height of wartime prosperity, we turn now to a consideration of the problem of immediate adjustment; that is, to the means by which the Corn Belt farmer can take maximum advantage of whatever elements favorable or unfavorable exist in the economic situation as it is likely to develop in the next few years.

As a preliminary to a discussion of this problem it may be well to point out several fairly evident premises. In the first place it seems quite evident that until there is a rather thoroughgoing change in domestic demands in the direction of a decidedly larger volume of perishable and semi-perishable agricultural commodities, production on Corn Belt farms must in general follow pretty much the same lines as it is now following. Corn will continue to be the central consideration in

our cropping program, and meat animals will continue to hold the major place in livestock enterprises. Further, the swine enterprise will continue to overshadow all of these meat producing activities. In the second place, it seems conclusive that we cannot, within a reasonably short period, adjust our volume of meat production to a domestic demand basis. Almost certainly no alternative uses of our agricultural resources can now be found which will enable us to realize a higher return than we can from the production of hogs and beef cattle as the chief means of utilizing our crops and pasture. It follows, therefore, that we must do our adjusting in view of dependence on the foreign market, for better or worse, for our present surplus of pork and pork products which, as has been indicated, amount to approximately fifteen per cent of our whole production. We shall likewise continue to make at least our normal contribution to the world's supply of wheat, though that, too, is a matter of meeting prices determined on a world market.

If we are right in assuming that our immediate Corn Belt program of production cannot be greatly modified so far as selection of enterprises is concerned, it follows that whatever can be done in the way of immediate adjustment toward better returns must be in two directions, first, a closer study of economic forces and conditions, with a view to adjusting our production as to amount and proportion so as to take maximum advantage of the demand for our several products as it develops; and, second, internal adjustment in the methods of operation looking toward greater efficiency and lower costs. In other words, we as agricultural economists must humbly admit that we have no miracle-working formulas to offer, that we cannot advise very much in the way of legislation which will lift the Corn Belt farmer to a new place of economic well-being, that we must fall back on the age-old principle of economy in the original and most accurate meaning of the term, that of administering one's resources in a way to secure from them maximum returns.

But to say this, with its implication that the ultimate responsibility rests upon the farmer himself, is not to say

that we have no responsibility in the matter and that the situation affords us no opportunity. The farmer needs economic education and economic information as never before, and our responsibilities certainly are not discharged by delivering ourselves of the few economic generalizations which fit the case. No real economic problem can be solved by such treatment. What the economist can do, and what he should feel obligated to do, is to study each specific problem in the light of generally accepted principles in order to see in what definite way the principles apply in the case in hand and to determine what will be the results of this or that proposed remedy. A scrutiny of the present situation in Corn Belt agriculture reveals a number of current problems of outstanding importance, a study of which may yield valuable help to the farmer.

Let us begin with the problem of a modification of the cropping program. We cannot hope to bring prosperity to the Corn Belt by abandoning corn production to a large extent in favor of new crops, but there are doubtless many acres where the traditional crop system may well be examined in search of details in which it may be modified to a greater or less degree in the direction of more profitable utilization of the farmer's land, labor, and other productive resources. For example, in many parts of the Corn Belt, particularly in Iowa and Illinois, oats are raised far in excess of the local feed demand. We may well raise the question whether a more profitable crop can be found to displace a part of the oats acreage in the rotation. Evidently it is retained to so large an extent because it is a spring sown crop and can be used to follow corn, whereas a fall sown crop such as winter wheat is excluded because the land is not clear of the corn crop in time for seeding, and its inclusion, necessitating its following other small grain, would serve to reduce the corn acreage, a thing the farmers on our best corn land rightly feel they cannot afford to do. In the eastern portions of the Corn Belt this difficulty is obviated by the fact that with the larger attention to dairying which is justified by the denser urban population it pays the farmer to cut for fodder or silage a very large proportion of his total corn crop, thus clearing the ground for winter wheat. This is one of

the important factors which accounts for the preponderance of winter wheat in the southern and eastern portions of the Corn Belt, where it is the most important small grain. Undoubtedly the western Corn Belt farmer is prevented from including as large an amount of winter wheat in his rotation as he otherwise would very largely because he has no economical use for the large amount of fodder which he could secure from cutting his corn, and feels that the additional labor involved in this operation would not be compensated for by the increased value of roughage. Doubtless in the future the livestock enterprises may be so modified as to make it more economical than at present to realize upon this part of the corn crop, and with it may come an increased substitution of wheat for oats in the rotation to the greater profit of the farmer. Production costs on winter wheat under Corn Belt conditions, as measured by the actual labor and power involved, are no doubt lower per acre than in the more specialized wheat producing areas and, the yield being considerably higher, the Corn Belt farmers are able to produce wheat as a part of their general cropping system at a price level which would be disastrous to the specialized wheat farmer.

It is probable also that barley may come to occupy a more important position in the Corn Belt cropping system than it does at present. In certain areas the feed per acre secured from barley is well in excess of that secured from oats, while the costs are approximately the same. It is altogether likely that a considerable substitution of barley for oats may gradually be brought about as one incident in the crop adjustment problem. Likewise there are other crops such as soy beans, sugar beets, and certain truck crops which are likely to enter in a minor way to supplement the cropping system to the advantage of the farmer in certain limited areas of the Corn Belt.

The second specific problem of readjustment which is of outstanding importance to the Corn Belt farmer is that of alternate cycles of under- and over-production of hogs in relation to the corn crop. Briefly, the situation seems to be this; an unusually heavy crop of corn, or more particularly a succession of heavy crops induced by unusually favorable weather

conditions, results in greatly cheapening this important Corn Belt feed. This in turn stimulates the breeding of hogs because the price advantage of converting cheap feed into relatively more valuable animal product is greatly increased. This secondary effect of favorable corn weather is felt within a year or two after the increase in corn production becomes a reality. The over-production of pork which this brings about in turn depresses pork prices and if, at about this time, we secure an especially light crop of corn because of an unfavorable season, the corn-hog ratio turns in the other direction and the farmers find themselves feeding high priced corn to very low priced animals, which in turn induces a sharp curtailment of breeding and the complex cycle is likely to begin all over again.

The economic disadvantage of this set of phenomena is familiar to everyone acquainted with Corn Belt agriculture. There have developed two general philosophies as to how the farmer should meet the difficulty. One is that the conservative farmer should adopt a fixed program as to the proportion between hog and corn enterprises, breeding practically the same number of sows every year and depending upon striking a favorable ratio at least half the time and of having on the average the maximum amount of the high priced product for sale when prices are most favorable. The other plan is that of attempting to forecast the changes far enough in advance of their actual occurrence to take maximum advantage of them; that is, to have a maximum amount of pork to sell when pork prices are at the peak and to have very few hogs to feed when corn prices are high, in order to realize the maximum from the corn crop through direct sale. Perhaps we will all agree that the latter plan is superior, provided the farmer is able to forecast with a reasonable degree of accuracy. The difficulty is that thus far he has apparently depended primarily on his own intuition or upon a very rudimentary type of analysis which has frequently caused him to be over-loaded with the low priced product and thus to be penalized for his efforts at meeting the market.

It would seem that our need in this connection is first of all for a thoroughgoing analysis of the cyclical behavior of all of

the elements in the problem. Some excellent work has already been done in this direction. Mr. H. A. Wallace has worked out a predicting formula by utilizing differentials from the normal in such factors as hog prices, New York bank clearings, and the corn-hog ratio.[3] Doubtless further refinement of the method he has suggested is necessary, but more particularly there is needed a study of the whole situation by means of which the results of such a formula can be interpreted and evaluated. In this connection informational work being done by the United States Department of Agriculture is of great value but needs further supplementation. All of the material supplied from these sources should serve as tools in the hands of those who are responsible for advising the farmer in this important respect. The popularization of such information as can be obtained by these means is primarily one of economic education of the farmer. It is a difficult job, worthy of the best efforts of the agricultural economist.

A third problem of readjustment which needs consideration from the point of view of immediate procedure is the place of beef cattle in Corn Belt farming. This enterprise has two important phases. The more conspicuous one is that of finishing cattle by intensive feeding. The other phase, equally important though less conspicuous, is that of rearing beef cattle to the finishing stage.

This latter phase is closely associated with the existence on the great majority of Corn Belt farms of a considerable amount of pasture and roughage which it is the current practice to utilize by means of raising cattle. The opportunity cost of this type of utilization is the possible returns from dairying on the one side and from sheep raising on the other. In limited areas where these resources are meager, particularly as to pasture, we find wool sheep tending to crowd out beef cattle. At the other extreme, because of the proximity of whole milk markets or because of certain peculiarities in the cropping system, we find developing a considerable interest in dairy production. However, throughout the greater portion of the belt, these unmarketable feed resources are still utilized

[3] The Problem of Business Forecasting, by Warren M. Persons, et al. pp. 237-249.

by the rearing of beef cattle. This is dictated, as already indicated, on the one hand by the nature of the resources and on the other by the demand for feeder cattle as raw material for the feeding enterprise. Ultimately, of course, the demand originates in the demand for beef, and the enterprise of cattle rearing is therefore influenced indirectly by the price of hogs and many other factors involved in Corn Belt feed utilization.

It is a peculiar thing that the general cattle enterprise on Corn Belt farms has received so little attention from either agricultural economists or technical animal husbandrymen. In Iowa this production of feeder cattle amounts to an average of about five head per farm annually. This low rate of output would seem to brand it as a minor enterprise. However, in the aggregate it is great enough to supply practically two-thirds of all of the cattle which are finished and shipped out of the state. The more conspicuous movement of feeder cattle from the western ranges and other sources into the state for fattening measures about one-third of the total cattle feeding enterprise. It is important therefore that this particular phase of the cattle industry receive more attention both from the point of view of adjustment to probable future demands and from the point of view of efficiency in farm production. Judging by observation from certain limited areas, a vast improvement could be made in the quality of this stock, in the conservation and use of feeds upon which it is reared, and in the most efficient marketing of it either through the producer's own feed lot or through sale to specialized cattle feeders.

So far as the fattening phase of the beef cattle enterprise is concerned, it is largely a question of whether the farmer shall buy feeder cattle and bring them to a high finish, risking the utilization of valuable feeds to the fluctuations of the market. The more fundamental and important side of this question is that of alternative use of feeds as between beef cattle and hogs or even cash sales of corn. It involves problems of the age and weight at which the intensive feeding should be begun, the spread required as between the price

of the feeder stock and the probable selling price of finished animals, the length of feeding and the degree of finish to be given, the time of year at which feeding may most profitably be carried on, and a host of other problems technical in their nature, but of profound economic significance to the farmer, each of which requires the aid of the most careful economic analysis.

On the marketing side, the immediate question arises as to whether the present domestic market, unsatisfactory as it seems to be, is the best that may be hoped for. It would seem that, with the degree of employment now existing in industry, the home market is probably almost at a maximum and that the unsatisfactory condition is due primarily to excessive supply. There is a possibility of somewhat greater strength developing in the case of a pronounced industrial and commercial boom. But there is far more chance of a less favorable market in case of a pronounced industrial depression. As far as the unfinished stock for fattening purposes is concerned, there is both actually and potentially a large supply. Feeds are potentially plentiful when we look beyond the present scarcity due to the partial failure of last season's corn crop. Better times then seem to depend primarily on the broadening of the market either through export or increase in domestic population. The former, though dubious, is not entirely without hope. The latter will seem to the farmer a very slow and inadequate means of bettering the present market situation.

The need, therefore, is for careful study of the whole beef cattle situation so far as the market side is concerned and of increasing efficiency on the production side. We have been wont to regard the hog as the most efficient converter of corn and other concentrated feeds into meat. We are supported in this by the physical ratios of utilization. But after all it is a matter of economics. When we consider the increase in value of original weight, the steer under favorable economic conditions will return as large a value for the feeds as can be obtained from feeding hogs. It would seem that for a considerable time at least the cattle feeding enterprise will

retain a very important place in Corn Belt agriculture. In the last analysis it seems to be another job for the price forecaster to study not only the outlook as to relative future values of beef cattle as compared with alternative products, but the relative advantage under probable future conditions of producing high finish as against low finish beef or merely feeders. It is also the job of the production economist to determine the relative advantage of different methods of production under a given set of forecasted conditions.

The last problem of readjustment from the immediate point of view is that of the individual efficiency of the farmer. For years agricultural education has been directed primarily toward this specific objective. More recently, however, the charge has been made that by doing this the farmer's educational agencies have wrought him a serious injury by weakening his economic position in the market and thus giving him less for a large volume of product than he would have obtained through less efficient methods resulting in a meager physical return. One will freely admit that the effect of a general and uniform improvement in efficiency has never been realized as a distinct advantage to the producers whose efficiency has thus been raised. Inevitably these benefits are gradually disseminated over the whole of economic society. However, the raising of efficiency is normally not a matter of general and uniform improvement but shows a very marked differentiation as between individuals. This differentiation, of course, is due to differences in the individual make-up of farmers, which induce them to react in very widely different ways to the same influences and opportunities. It is this differential in efficiency which is of profound significance economically. The man of superior ability who will profit by all of the means of improving his efficiency which are offered to him is the man who will rise above his fellows and reap an individual differential of return. That is true, of course, because the market demand is not satiated by the product of the efficient farmer, but requires a considerable portion at any rate of the product of those who are inefficient. It is through this fact that the more efficient ones are able

to maintain their differential of advantage. In view of this it would seem that we are amply justified in promoting efficiency at every opportunity.

If teaching the farmer greater efficiency is not an economic crime against him but a means of his economic salvation, the question arises as to what lines of opportunity in the improvement of production methods Corn Belt agriculture presents. It is feasible here merely to mention a few lines of possible improvement. Some of these have already been implied in the foregoing discussion. In the first place, vast improvement might be made on many farms in the utilization of land devoted to permanent pasture and hay meadow. Too few Corn Belt farmers realize the full value of this important resource. Secondly, great gain could be made in the quality of livestock carried on Corn Belt farms in spite of all that has hitherto been done in this direction. This is particularly true of the ordinary beef cattle herd. Better breeding and feeding would add materially to the profits of many of our farmers. A third sphere of possible improvement is in the technique of crop practice. Our farm organization studies covering the present period of depression have unmistakably pointed to the waste of labor on farms as an important source of loss. In these and many other lines there is abundant opportunity to develop greater efficiency on Corn Belt farms. These opportunities should not be least in the consideration of the agricultural economist when contemplating his responsibility in the present situation.

III. Readjustment From the Long-time Point of View

Up to this point we have stressed the adjustment problem from the point of view of the immediate future. There is space for only a bare outline of what should be considered from the point of view of a long-time policy. In taking this longer view of the probable trends of Corn Belt agriculture in the next twenty-five years, it is well to lay down some elementary postulates with reference to the economic influences which are likely to impinge upon the farmers of this region

as well as some of the probable effects of these influences upon their farming activities.

In the first place, it is reasonable to count upon a rather substantial increase in domestic population. In the second place, we may likewise depend upon a constantly increasing proportion of this larger population being engaged in industry rather than in agriculture. Third, this being the case, there will be an increasing advantage in the production of non-staple agricultural commodities in the place of the staple commodities which have figured so prominently in the development of American agriculture up to this point. Lastly, we may well expect to have to reckon with an increasing preponderance of the influence of the industrial and capitalistic classes in the councils of the government.

We may next turn our attention to some of the probable modifications of the Corn Belt agriculture which are likely to make themselves manifest during the next few decades as a result of the influences just indicated. The expansion in American industry which we may well expect is not likely to be confined exclusively to the eastern seaboard to the extent which it has been up to the present. The great waterway formed by the lakes, with vast ore deposits at one end and coal deposits at the other, has already given us a nucleus of industrial centers along its route. It is altogether to be expected that these industrial centers will expand and that the type of their industrial output will become more complex. Such a development cannot fail to have a profound effect on Corn Belt agriculture. This effect will doubtless be realized in the direction of greater profits to be found in the production of milk, truck crops, and other perishables as compared with present Corn Belt products. It will mean, then, on the whole a greater intensity of land utilization with all that this means in the relation of labor to land and in modifications of land tenure.

However, in seeking to forecast the probable effect of the great influence of industry upon agriculture, we must not lose sight of the equally profound influence which the nature of agricultural resources will have upon the future develop-

ment of farming. The heart of the Corn Belt is composed of an area of unusually productive land. Because of these conditions, coupled with its favorable climate, it is of outstanding importance in the production of corn. Similar areas in the agricultural regions of the world are so scarce and the advantage of corn production with its accompanying meat producing enterprises are so obvious, that we may seriously question whether industrialization is going to eliminate meat production as a major enterprise from this area. Doubtless the methods employed will be greatly modified but it would seem that the enterprise itself will be relatively permanent. The same is not so true of the other areas of the Corn Belt where the advantages of corn production are not so obvious. We are likely to see vastly greater changes in our corn belt type of farming on the areas where corn yields now are lower and where the percentage of the farm land in corn is not so high.

In view of such probable changes as can be pointed out, it is important to list for brief comment the needs of Corn Belt agriculture in view of such changes. The first and most obvious need is that of economic education of the farmers themselves. This point cannot be expanded here but the basis for such need is undoubtedly sufficiently obvious. Another need is for a vastly improved economic service on the part of the farmer's governmental agencies. If the farmer is going to adjust his business to the profound changes which seem to be ahead of him, it will be necessary not only that he have economic education which will enable him to understand economic forces and adjust himself to them, but he must have economic information far enough in advance to enable him to make the adjustments in a rather inflexible type of business made necessary by these impending changes. Still another need is that of improvement in technical knowledge. Reference has already been made to this and it is not feasible to expand it further here. It is perhaps sufficiently clear that the farmer of the future must be more skilled in the technique of his own production than he is at present. A fourth need is that of an intelligent social control of land ownership and tenancy. Our rapidly rising land values of

the last few years have made it uneconomical for the farm operator to invest his funds in land. This means that the opportunity to farm, which is dependent upon the control of a sufficient area of land, has become too expensive so far as securing it through the medium of ownership is concerned. There has come with this situation no countervailing development of tenant rights looking toward a satisfactory adjustment of relations between owner and user which should be the primary basis of permanence of occupancy upon which successful farming so largely depends. This is a problem, it would seem, in which the government must have a very appreciable part. A factor then in the shaping of any satisfactory agricultural policy for this region is the matter of future relations between the land of the Corn Belt and the users of it.

Finally, we should mention the need of a more intelligent political leadership for agriculture. It should be sufficiently evident that, with the expanding of industry which is even now upon us, the farmer cannot expect to be a dominating influence in the political councils of the nation. He can, however, in view of the importance which agriculture will always hold in our national economy, exercise a very important influence upon legislation, provided he sees the economic significance of his position and has leaders who can adequately represent him in Congress. It is within the bounds of possibility that within the next few decades there will develop a very pronounced political issue between the proprietors of industry on the one hand and industrial laborers on the other, something similar to what has already developed in Great Britain. If this comes about, the agrarian interest, representing a third party, may be in a strategic position and hold the balance of power. This advantage, however, cannot be realized upon unless the political leadership of the agricultural class comes to have a better understanding of the true economic interests of farmers and is willing to represent them with fidelity.

FARM MANAGEMENT PROBLEMS IN THE NORTHEASTERN DAIRY BELT[1]

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The history of the development of dairy farming all over the United States to meet the demands of urban expansion for milk and its products is well known. I shall therefore omit the historical in considering the question of how the dairy farmer of today in the northeastern section of the United States can organize, manage, adjust, or reorganize and readjust his farming operations in order to assure unto himself some reasonable chance of making wages for his efforts and 5 per cent on his capital. Instead, I will consider present systems and some of the simple problems of farm management confronting the dairyman. Possibly we can then more carefully visualize and suggest helpful changes for some of the problems that confront some of the eastern dairy men—only a few of the problems of only a few of the dairymen, because what is right for one may be entirely wrong for another, and the problems are so intricate that some must be omitted.

Systems of Dairy Farming in the Northeast. There are many ways of dairy farming, all now in practice and most of them likely to continue for years. Classified on the basis of the kinds of machines used, they appear as systems with scrubs, good grades, poor pure-breds and good pure-breds. All that should be said about scrubs and poor pure-breds is that they multiply fast enough but never get the right answer. Classified on the basis of diversity of organization, they are systems with and without cash crops or other complementary livestock enterprises. Classified on the basis of intensity of operations, they are certified milk, retail, grade A pasteurized, grade B milk, creamery milk, and cheese factory milk. Usually—not always, of course—the more intensive systems are the more profitable because, after all, intensity of application in management and the use of capital in farming is

[1] This paper was read at the Fifteenth Annual Meeting of the American Farm Economic Association, held in Chicago, December 31, 1924.

much like intensity of application in the class room or anywhere—the workers win. Generally, the more intensive farmers are the hardest workers.

The General Economic Situation With Reference to the Dairy Industry

Economic depression results from a disturbed balance between cost of production and price. It may be due either to relatively high costs or to relatively low prices or to both. The so-called present agricultural depression in the northeastern dairy regions has been a matter of relatively high costs more than of relatively low prices, although both prevail. However, it is sometimes wrongly considered entirely a matter of prices depressed far out of line with the general price level. The annual percentage changes in the farm prices of New York farm products for the past eleven years have averaged 14 per cent of the index number of the preceding year, and the annual changes in the general wholesale price level for the United States, 13 per cent of the preceding year's index number. In some of the dry years the advance has been more or the decline less in the prices of New York farm products than in the United States general price level, and in some of the wet years the advance has been less or the decline more than in the United States general price level. This is to be expected because of the increased production in wet years, and the decreased production in dry years. The economic predicament of dairymen in general, therefore, is that prices for their products are following a downward swing faster than the taxes, labor, and many other operating expenses and the cost of living, but not so much faster than the general price level. It would appear that milk prices in the northeastern dairy belt have been all that could be expected in relation to the general price level, but of course not all that could be desired with reference to cost of production.

Competition has been severe in the dairy industry for many years. With improved transportation and stimulated production in the West, it will become more severe. Northeastern

dairy farmers can do very little individually to increase price. Generally speaking they cannot avoid low prices by shifting out of the dairy enterprise into some other enterprise. They must face prices by shuffling along with a brisk attitude rather than by shifting out with a sorry face.

The successful use of the insulated tank car to transport milk has resulted in some belief that Western milk has at once been brought to the Eastern city markets. Possible things are not always practical. One ton of concentrates produced in the West can be shipped East and combined with enough silage and hay grown in the East to produce three tons of milk. The ton of concentrates can be shipped from the West cheaper by freight than could three tons of milk by refrigerated express. Why ship the milk, when we have plenty of outdoors and hay in the East? Further, if necessary, one cow plus the one ton of concentrates can be shipped from the West cheaper than the three tons of milk. The most perfect kind of a container does not reduce the bulkiness of milk—it only prevents spoilage. We now have practically 95 per cent of the concentrates used on Eastern dairy farms grown in the West. Next, as more milk is needed cows may be shipped east. It seems to me that milk for fluid use, however, will not be shipped such long distances for many years except in emergency.

The regions of cheap production in the Central West where the dual purpose cow is kept to use by-product, coarse roughage will produce much butter. The freight on a ton of concentrates shipped east would pay the transportation on the butter-product of 10 or more Corn Belt cows. The possibilities of increasing butter production in this area are tremendous and this has a significant influence on fluid milk and cheese prices. Northeastern dairy farmers have less price damage to fear from New Zealand, Denmark, and foreign production in general than from the stimulated butter-production in the mid-West that will result from slight price advances.

A study of prices of milk at shipping stations in New York to producers, the wholesale price of butter, and wholesale prices of cheese in New York City shows that for 50 years

ending in 1917 the annual average prices of milk per 100 pounds at shipping stations have averaged 5.4 times the average wholesale price of a pound of butter, or 12.3 times the price of a pound of cheese. When these 50-year average ratios are applied to the prices of butter and cheese each year, and the two results averaged, one has an expected price of milk based on the price of butter and cheese. For 56 years the expected producers' price of milk in New York State determined in this manner has averaged within 7 cents a hundred or 4 per cent of the actual price. That is, 5.4 times the yearly average wholesale price of butter $+12.3$ times the yearly average wholesale price of cheese ± 4 per cent, divided by 2, equals the yearly average price of milk. In 30 years out of the 56 it comes within 5 cents a hundred of the actual yearly average price of milk. The price for any month is entirely a different matter for obvious reasons, but closeness of yearly milk prices to a constant relation with butter and cheese prices is indicated by a 4 per cent average difference for a 56 year period. The manufacturing and fluid milk phases of dairy production are so interrelated that stimulated production in butter and cheese territories must influence the price the northeastern fluid milk producer receives.

Returns for Labor and Capital on New York Farms in 1921 [1]

Since the general economic position is so familiar, the situation of particular groups may be of more interest. Table 1 shows the returns for labor and capital for the year ending April 30, 1922, on 531 farms.

The cheese factory farms are in a region of both yankee and limburger factories. The soil is heavy clay, and the topography level to very slightly rolling. Corn for the silo usually does not yield well. Very little concentrated feed stuff is purchased, only 913 pounds total per cow being used. The winter grain ration for cows is chiefly oats and barley

[1] Some of the results given in this paper were obtained in a study by the writer, made possible by the cooperation of the Divisions of Cost of Production and Farm Management of the Bureau of Agricultural Economics of the U. S. D. A. and the Department of Agricultural Economics and Farm Management of the New York State College of Agriculture, Cornell University.

TABLE I. RELATION OF SYSTEMS OF DAIRY FARMING TO RETURNS FOR LABOR AND CAPITAL ON 531 NEW YORK FARMS, 1921

System of dairying	County	Number of farms	Average labor income	Average value of operator's time	Returns on capital above value of operator's time	Crop sales per farm	Cow cost of milk per 100 pounds	Price per 100 pounds	Asked per hour of labor	Returns from cows per hour of labor
					per cent				cents	cents
Cheese factory milk without cash crops	Jefferson	67	—$370	$846	—3.7	$151	$2.45	$1.62	23	—1.7
Condensery milk without cash crops	Chenango	83	— 178	901	—3.3	112	2.73	2.04	27	3.2
B-milk with alfalfa roughage and some cash crops	Madison	125	+ 228	938	+0.4	801	2.50	2.18	25	13.9
B-milk with mixed hay and cash crops	Chenango and Madison	121	+ 321	1012	+0.8	1043	2.56	2.10	27	9.3
A-milk with mixed hay, no cash crops	Chenango	84	+ 299	826	+1.0	71	2.59	2.43	26	19.8
A-milk with ⅓ alfalfa, ⅔ mixed hay, cash crops	Cortland and Onondaga	51	+1065	1170	+4.5	1671	2.79	2.62	31	24.3

grown on the farm. Most of the cows freshen in March and April, the cheese factories usually opening in April and closing in November. The milk is kept at home the remainder of the year and fed to calves and pigs. The average value of the operator's time as given by the 67 men was $846 per year, but the labor income was —$370. The return on the capital above the value of the operator's time was —3.7 per cent. Some hay is sold in good years, but the hay production was low in 1921, the crop sales per farm amounting to only $151.

The remaining farms are situated in good valleys, and on the uplands adjacent. The producers of Grade B milk with alfalfa roughage were situated in a very rich limestone region, alfalfa growing in abundance by seeding in the spring with oats and barley without inoculation or use of lime. The crop sales, chiefly alfalfa hay and market peas, amounted to $801 per farm. The average labor income was $228, and the returns on the capital above the value of the operator's time was .4 of one per cent. The producers of Grade B milk with mixed hay roughage were located just south of the alfalfa area, so that the same climatic conditions prevailed. The soil, however, is too deficient in lime to grow alfalfa without considerable expense. The crop sales were higher, $1043, because of the production of more potatoes and cabbage—intensive cultivated cash crops. The labor income was $321, and the returns on the capital above the value of the operator's time was .8 of one per cent. The producers of Grade A milk without cash crops adjoin the preceding area, and the labor income was $299. The returns on the capital above the operator's time was 1 per cent. The last group shown in Table 1 produce Grade A milk and sell cabbage, potatoes, and factory peas as cash crops. One-third of the cattle roughage is alfalfa hay, and two-thirds is mixed hay. The labor income was $1065 and the returns on the capital above the value of the operator's time, 4.5 per cent.

This study indicates that for this particular year, when crop prices were very good, the farmers following a more intensive system received decidedly more pay for their labor

in management than those following the extensive systems. While this relation might not hold in all years, especially in years like 1924 when the July, August, and September rainfall in western and central New York was 140 per cent of normal and crop production very abundant, it probably is true when a long period is considered.

The difference in the average labor income between producers selling to a cheese factory and those receiving fluid milk prices plus a premium for low bacteria count, and the additional income from sales of crops was $1435 per farm or $120 a month. This was not entirely, but chiefly, due to the difference in system and to the location which made the differences in price possible, and the differences in practice profitable. Many of the men in Jefferson County were as good thinkers, farmers, and business men as those in Cortland and Onondaga Counties. They did not have the opportunity of expressing themselves in the fullest measure because of a heavy soil, a location 100 miles further from the large city markets, and other less favorable circumstances. Transfer them and give them as much acquaintance with the more favorable regions as the other men had, and probably they would do equally well. One cannot venture a recommendation for improving the financial position of a dairy farmer until he takes full cognizance of the general situation as it affects that particular farmer. It would be folly to recommend the feeding of more grain and more intensive working of the land in the cheese factory region, because the market for the product does not justify the liberal use of grain for winter feeding and may not even justify the use of a silo. The situation in the alfalfa region does not call for the use of more concentrates or of leguminous roughage or of much better cows, because these farmers surpass all of the other regions in these respects. The chief problem in this section, where dairying has superseded hop-growing, is one of reorganization, of combining small farms that were laid out when hop-growing was the leading industry and which are now too small for most efficient dairying. Another problem is that of the building arrangement, because hop-growing called for a large house to house the pickers and not much of

a barn, but alfalfa and dairying require more barn capacity. One can see many alfalfa and straw stacks now, where ten or fifteen years ago the concentrated product of the farms—hops—could be readily stored in the small barns which many of the farms had and still have.

The farm management problem for the producer of A Grade milk, who now has some alfalfa and who produces intensively cultivated cash crops, is largely a problem of economy in operation. With a good market for milk, he needs to know the cheapest way of replacing his herd so as to permit of the maximum milk output. Since he is carrying large numbers of animals, which require much work in April and May, the months when he needs to get the land fitted and crops planted, one of his most important problems is to accomplish the field work with the same crew that cares for the animals. This calls for labor efficiency of the highest order. Also, since he is using large quantities of grain, the problem of economical purchasing is very important.

In spite of the fact that each set of conditions calls for a particular solution, there are many ways of meeting the difficulties in management that occur at times of disturbed financial adjustment that are applicable to dairymen in general, regardless of the system they are following.

Milk Output First—Cattle Second

The economical production of milk must be given foremost attention when running a system of farming pivoted on the dairy. A few farmers always lose by spending too much money in producing choice cattle, when their first thought should be cheap cheese. Cheap products are slow pay for expensive draperies. In some instances raising pure-bred cattle pays more than milk ever could be made to pay. In other instances, it not only has prevented the accumulation of property but has dissipated past accumulations along with current earnings. In most instances emphasis on milk pays best in the Northeast. At all times the pure-bred business is a costly system, to be entered into by only a few with extreme caution and, to be profitable, carried on with conservatism rather than with too much generosity. Some persons starting in farming and others in the business desire to and will raise pure-bred cattle. Prices for pure-breds, except Guern-

seys, are now low. Those who expect to have pure-bred cattle ultimately may save money by starting their herds now.

What is an Efficient Size of Dairy Farm Business?

To indicate an efficient dairy farm unit means first a decision as to what measure to use. Is it a farm of so many acres, so much capital, so many men, or so many cows? A one-man dairy farm cannot be efficient. Neither the amount of capital nor the number of acres indicate how many cows can be kept. Therefore, I believe it is first the greatest number of cows that the operator and the equivalent of one man by the year can care for and grow winter roughage for.

In the regions indicated in Table I, the average number of cows was from 19 to 25, and the average man equivalent from 2 to 2.5. It would appear that two men can care for 25 cows, keep young stock, and with some extra help in harvest grow cash crops to sell. If a milking machine is used, two men will handle 30 to 40 cows. These men could also care for a poultry enterprise, especially if the women attended to packing the eggs and helped in raising the chickens.[2] The amount of capital in New York necessary to carry on such a business is from $12,000 to $25,000. Three to four horses will do the work. Under such conditions, each man handles from 25 to 30 acres of crops and from 10 to 20 animal units, besides the horses.

Intensive Crops Must Be Grown

Land has become more costly and, although the use of it at its enhanced values may still be cheaper than hired labor, the farm business must provide many hours of work if accumulation is to take place at low rates of pay per hour, since

[2]A poultry enterprise of moderate size of a commercial egg breed would improve the financial position of many dairy farmers in the northeastern part of the United States. In many cases there are elderly persons or children on farms who are not capable of doing the heavy work caused by a dairy, but who can readily wash and pack eggs, feed laying flocks, and raise chickens. There are farms where whatever income can be realized above the cost of feed, use of buildings and depreciation on a poultry flock would be so much additional gain for the family, because of the utilization of this labor. This is particularly true where the local demand for eggs is good, where buildings are available or can be fixed at slight cost, or where some wheat and other grains are now grown.

the majority of the work on dairy farms is done by the operator's family. This suggests intensive crops as potatoes and cabbage with high labor requirements per acre rather than the extensive wheat and hay which, although they may pay well per hour, do not provide enough business. Only in regions of a large proportion of crop area do dairy farmers grow wheat as a cash crop. The returns per hour are high, but the crop does not furnish enough income per acre.

On some New York farms the returns per hour were as follows: hay 88 cents, wheat 57 cents, potatoes 55 cents, cabbage 51 cents, oats 1 cent. But the returns per acre were: hay $9, wheat $14, potatoes $53, cabbage $51, oats, nothing. Obviously, it is potatoes, cabbage, and market peas that will provide plenty of work for the family and thus a higher farm income. In some sections canning factory crops can be grown. This year the farm to the north and the first two to the south of my own place grew 41 acres of beans for canning. This canning company grew and contracted 200 acres of beans, yielding 400 tons. They paid the farmers $37.50 a ton, and picked and trucked the beans to the factory. The income was thus $75 an acre plus a fine growth of highly stimulating milk producing fodder. Wherever such crops can be grown, it is more profitable to buy oats for horse feed and bedding than to grow oats or wheat.

Shifting the System

Progress in all lines of endeavor necessarily requires shifts in the system to keep in adjustment with the changing markets which follow in the wake of expanding city population. When to shift, in what direction, and how far, is always the perplexing problem. If golf grounds or city lots are needed, shifting the place of business or even shifting out of the business altogether may be the way to make the most money. If the milk shipping business is extending to marginal territory, changing from the summer system for the cheese factory or condensery to more winter milk may improve one's financial position. If a price premium is available, shifting to buying

the cows instead of raising them or to a new breed may pay. Farming ordinarily requires very little shifting of the system, but when shifts are desirable the dangers are chiefly from extreme reluctance, rarely from extreme haste. Some farmers need to take up the slack in shifting the system. However, since shifts require time and are often costly, one should be sure before making the change that the new system will pay better after it is established.

The reduced after-the-war income has encouraged farmers to work harder to make ends meet. Some have plowed pasture land never worked before, others have been selling wood, still others doing custom work of various kinds—in general putting in more time—all to try to keep up the income. At the same time, on many Northeastern dairy farms the output of milk has been diminished not by less animals or less silage and hay, but by less use of concentrates, which still have to bear high freight rates, and by more use of silage and hay, so that the animal still receives as much energy as before the grain allowance was cut, but a cheaper ration.

Price Premiums

Dairymen should strive for price premiums, as they better the income without a corresponding increase in costs. This is not always true of increased rates of production. The opportunities for anything above usual prices by catering to a special market or by careful methods will always be limited, but compensating. In New York there are about 3600 dairymen producing Grade A milk for the metropolitan district who receive premiums of about 25 cents a hundred for producing milk with low bacteria count. There are many more persons in cities who are able to pay this slight extra cost for careful production methods. Such a premium when milk is $2.00 a hundred is more profitable than any method that will increase the average herd production 10 to 15 per cent or 750 pounds per cow. In the city of Ithaca two cents more a quart at retail is realized for Guernsey milk with its yellow color and heavy cream line than for ordinary milk. For years,

producers who have been willing to endeavor to produce a fairly constant supply for milk peddlers have received 10 cents or more premium per hundred pounds above the usual producers prices near many small cities. The price premium applies to cattle as well as to milk. The maintaining of a tuberculous-free herd so that real beef rather than bologna prices can be realized for animals turned off helps to lessen the heavy depreciation that comes from thin, broken-down animals. In its way this is a price premium for carefulness. Premiums are but a bonus for extra care, effort, and foresight. The dairyman who produces cash crops likewise, has with potatoes, oats, and possibly other crops the same opportunity of producing carefully selected heavy yielding strains that will demand a premium for seed purposes.

Increasing the Net Rate of Production or Least-Cost and Greatest Profit Practices

Since the price of milk cannot be expected to increase materially, the possibilities of these operators getting better returns for their labor are chiefly in economy of operation, so that the net rate of production is increased. The relation of cost of production to the results of the business as a whole for a two-year period in a region with alfalfa roughage are shown in Table II. The farms following the least-cost systems are the most profitable. The same factors which cause a high cost, such as unfavorable size of business, poor cows, and uneconomical feeding, also result in low returns for the

TABLE II. RELATION OF COST OF MILK PRODUCTION TO LABOR INCOMES

1921				1922		
Cow cost of milk per 100 pounds		Average labor income	Number of farms	Average cow cost of milk per 100 pounds	Average labor income	Number of farms
Range	Average					
$2.00 or less	$1.82	+$784	31	$1.73	+$856	20
$2.01–2.50	2.31	+ 341	35	2.26	+ 18	24
$2.51–3.00	2.75	— 28	34	2.72	0	35
Over $3.00	3.83	— 269	25	3.62	— 593	29

business as a whole. With any given system of dairying as to type of business, kind of roughage used, and prices, the least-cost method of selection will generally find the most profitable farms. If farms of many different types such as cheese factory, B milk with alfalfa roughage, and A milk are intermingled, then it is very obvious that the least-cost system may not necessarily be the most profitable system. Cost accounts and cost of production studies are of much assistance in planning the management of farms in difficult times, and any program for studying the readjustments necessary in farming will certainly miss the mark if cost studies are omitted.

The desirability of alfalfa as a roughage for young cattle or milk production cannot be denied. Its cost has been given less consideration than its value. The keeping of a cow on alfalfa roughage is more expensive than on ordinary hay but the cost per unit of product is decreased by its use because it is highly stimulating to milk production. The feed cost per cow in 1921 on 125 farms in New York with alfalfa roughage was $91, and on 83 farms with ordinary roughage $78 per cow. The feed cost per 100 pounds of milk, however, was $1.46 as against $1.57. The cost with ordinary roughage was $13 less per cow but 11 cents more per unit of product.[3]

The effort required in the production of feed for cows and the handling of the product is so great that, when prices fall and farm wages lag, it becomes more important than formerly to make each move count. While farmers as producers are efficient, there are many operations not now performed that would save labor, and some operations done in ways wasteful of labor. In past farm management research, such factors as the total income, the number of sources of income, the capital and production per cow have been stressed. In farm management studies of today, the entire farm expense column needs

[3] First cutting alfalfa hay has about the same value as mixed clover hay from new seedings. Second and third cuttings have a higher sale value, because they cost more to harvest and are worth more for feeding. In one New York dairy region with alfalfa 83 per cent of the first cutting and 66 per cent of the second cutting were fed. The proportion of the first and second cutting entering into the rations varies chiefly with conditions which favor the relative yields of the two cuttings. The average value of all cured alfalfa fed was $14.33 per ton in 1921, and $11.96 per ton in 1922. The average values of mixed clover hay were $13.61 and $10.83 and of timothy $15.23 and $11.60.

to be expanded into many tables to collect some information on economy of operation—to learn more about the most efficient ways of farming. In short, how can dairymen get the same amount of work done and the necessary material for production more cheaply? Some farmers certainly have found ways that it would benefit others to know. Larger fields, larger teams, the use of mechanical milkers, manure spreaders, in some instances the tractor and the use of other labor-saving arrangements should be coordinated with the results from their use and shown in farm management research. Such analysis should then be succeeded by good extension programs so that producers may be given the benefit of the studies.

Some farmers are reducing their business by selling off their cows, letting the hired man go, raising a large number of heifers, and growing more salable crops. Sometimes the tenant house can be rented. This is one way of economizing in operation, but often a financial sacrifice is necessary on cows sold.

Pastures furnish very cheap feed for animals for about 5 months in many dairy regions. But these pastures have not been improved by more seed, dragging, and the like. They are getting run out. Most of the time and money has been spent fixing the buildings. Now that this is done on many farms, considerable attention should be given to the pastures, chiefly in the way of seed and things that will produce more feed at no great cash expenditure. This will give more complete employment to help and will save winter feed. In some instances very distant fields should be pastured instead of cropped.

Heavy grain allowances increase the risk of udder trouble, and probably cause a greater depreciation on cows. In times of high grain prices and low milk prices the resulting increased production from liberal grain feeding may not be sufficient to pay for the high priced grain and compensate for the extraordinary depreciation on the animal. Uncertainty of milk prices also justifies farmers in not feeding as much grain as they otherwise would. Formerly, prices were an-

nounced for a six-month period in advance, enabling producers to make plans. Now the net price received by members of some of the cooperatives is not known till the 25th of the month following the month in which the milk is produced. This of course does not come early enough to enable much planning of practice. The result is an attempt to be cautious but, with the prices received in New York State, most of them discover two months too late that they have not been cautious enough. The economies resulting from the purchase of grain in quantities, and at times of year when prices are lowest is a more important farm management question now than before milk and feed prices were put out of line.

Some of the companies have bought milk for distributing cheaper directly from farmers than companies buying from the cooperative association, and yet paid their patrons more than cooperative pool prices. This of course has placed different dairymen on different price bases. One of the price adjustments ultimately necessary in the milk business will be the elimination of this difference between prices received by members of cooperatives and non-members.

The improvement and painting of buildings, laying of tile, and building of new fences on dairy farms should be delayed whenever such delay does not interfere too seriously with the efficiency of farming. Skilled labor and day labor are yet too expensive for farm use. One of the functions of distribution which farmers can assume more fully is that of equalizing the flow of products to market. Farms should be used more to hold products such as cabbage, potatoes, feed, wheat, and the like, but on many farms, good storages are lacking. If building changes are made they should be confined chiefly to such changes as will enlarge the business, such as providing for housing of poultry, storing cabbage, potatoes, or feed, or keeping more cattle. Raising roofs to store more hay or straw might well be deferred. The building of additional silos is in the direction of more intensive dairying, generally not wise in a deflation period, unless special milk prices are to be had. In some sections, if the old silo is about gone, some consideration should be given to the wisdom of rebuilding.

The truck and tractor have taken the country by storm. After the savings are gone and the thing breaks down, the enthusiasm lessens and the cost is charged to experience and excitement. Some farmers need them, others stand in greater need of more land, modern and better barns, better houses, better stock, and so on. These two pieces of machinery have been simply an additional expense on some farms. Good judgment regarding machinery presupposes that the purchase of machinery that will not either increase the volume of the business or decrease the costs enough to cover the annual cost of the machine be deferred and that, when an expensive machine is bought, particular care should be given it to avoid heavy depreciation and repairs.

More repair work can be done on the farm. More work in fixing machines and getting them ready for the next season's use can be done during the winter and slack times. Repairing of machinery should not be, but is left until it is needed. At times when the labor efficiency is so important such means of enabling the most work to be accomplished should be taken full advantage of. Horseshoeing expenses can sometimes be kept down by doing the work at home, but probably the greatest expense for repairing machinery can be saved by going thoroughly over the machinery and wagons more frequently, to tighten bolts and replace parts. This, if done in time, will save breakage. A few more wrenches and shop tools, a good vise, work-bench, anvil, and forge would soon be paid for by savings in repair bills.

Labor.—When times are dull the dairyman should try to reduce his labor expense. If the sons are not attending school and more than are needed remain at home, some had better start as hired men for the neighbors who are not so fortunate. They will then be ready to become tenants and owners when expenses lessen and farming comes back. If, by decreased attention to the cattle and by slightly less intensive farming such as the raising of more heifers and less milk, the expense of the hired man can be saved, this will prove advisable on some straight milk farms. To be profitable on a straight dairy basis, a hired man at $80 must grow the roughage for and produce over 40 tons of milk a year, at $2.00 per hundred.

As the number of boys remaining at home on the farms has decreased, farmers are cooperating more with neighbors in haying, grain harvest, threshing, silo-filling, potato digging, and many other kinds of work. This enables more work to be accomplished with less hired labor, and promotes a good community spirit. More of it can and should be done. One fault in the organization of such gangs is sometimes evident—more help is on the job than enough to operate at the greatest efficiency. As this is sometimes the result of too few machine outfits in the neighborhood, in some cases the partnership purchase of silo-filling and threshing outfits would save money.

In Herkimer County, New York, on 163 farms averaging 25 cows per farm, 50 per cent of the labor on cows was done by the operator, 11 per cent by the operator's wife, 14 per cent by the operator's sons, 2 per cent by the daughters, and 22 per cent by hired labor. Thus 78 per cent of the work was done by the operator's family. Of this labor 53 per cent was in milking, 36 per cent in feeding and care of cows and product, and 11 per cent in other tasks. Over half of the labor in milk production, therefore, is of the kind that women and children can do. Low prices prevail and, so long as women and children continue to work on cows, will prevail. The milking machine is expensive and, by all hands milking, a few more pennies can be got together for living. The adjustment of the cropping system so that fields nearest the buildings can be put into silage or other crops requiring many trips per acre can be done as a temporary shift to save labor.

More attention needs to be paid to developing systems of dairy farming that provide good distribution of labor throughout the year. The schedule of labor on dairy farms with cultivated cash crops is as follows:

For the entire year, milking.

From January to March, cutting wood and harvesting ice.

From March to April, making syrup, plowing, planting peas and oats.

May, making cabbage seed-bed, planting corn and potatoes.

June, cultivating, setting cabbage, and harvesting first cuttings of hay and peas.

July, cultivating cabbage, spraying potatoes, harvesting peas and haying.

August, harvesting oats and second cuttings, and cultivating cabbage.

September, filling silo, digging potatoes, and harvesting second or third cuttings of hay.

October, digging potatoes and harvesting cabbage.

November, harvesting cabbage, plowing.

December, cutting wood, working in barn.

The addition of a poultry enterprise of 500-800 hens to the above completes a well-organized business. In regions where crop land is more abundant or the markets for cabbage and potatoes poor, extensive crops such as wheat and more spring grain could be added.

The harvesting of alfalfa requires much labor, especially when cut green. The method of cutting only enough of the green alfalfa for one or at most two or three days soiling requires too much labor. Frequent cuttings are necessary because of the tendency to heat and mold if it is to be fed green, but the real question is whether it pays to feed green or cure it. Probably more extensive methods such as curing, while resulting in less production, would pay better if the labor saved were put to some productive use. Soiling crops are too expensive generally and especially when wages are high.

Fertility Maintenance.—The fertilizer practice needs to be carried out with extraordinary precaution. Fertilizer makes quack and weeds grow as well as corn; if its use is not followed by proper cultivation, money is wasted. In adjusting to deflation prices, sometimes labor is reduced and no change made in fertilizing practice. Keeping all parts of the business adjusted is difficult, but it is more necessary now than when prices for milk and crops bear a more favorable ratio to cost. The regular use of acid phosphate, because it has been relatively cheap, is likely to pay in the end on dairy farms with cash crops, although in any one year prices may not justify the application.

Since most soils require applications of lime to produce clover abundantly and larger applications to produce alfalfa

at all, these crops are more expensive than timothy and ordinary grass hay. The use of lime for clover will generally prove profitable, but in many sections it is necessary to apply so much lime to obtain anything like a good stand of alfalfa that it becomes too expensive. Many Farm Bureau signs proclaiming "Alfalfa is the cheapest source of protein" are hanging in regions where homegrown alfalfa is a very costly source of protein.

The manure applied per acre of crops receiving manure in the regions referred to in Table I, varied from an average of 10.5 tons to 13.2 tons per acre. From 3.4 to 3.8 tons of manure were produced for each acre of crops grown. The most economical use of manure is one of the ways a dairy farmer can save expenditure for commercial fertilizer. With the more extensive systems of dairying on some of the heavier soils, it is questionable whether application of commercial fertilizer pays for any crop. In such cases the use of a manure spreader, so that the manure can be made to cover a large area by thin application will result in the greatest increase of crop production for a given quantity of manure. On many farms in such areas the tenant will tell you he piles the manure to keep the barn warm, but he really does it for his successor. The city milk inspector, the belief of the farmer occasionally to the contrary notwithstanding, has benefited many farms by making them more healthy places to live and has increased crop yields by getting the manure spread. In case of more intensive systems where crops which have a high value per acre are grown, more efficient use of manure would result by applying more of it where the crop which has the high value will receive more of the benefit than by applying it to hay or other less valuable crops. On soils of open texture much is likely to be lost through leaching, and the wise use of manure in such cases is for top dressings of meadow lands. The increased growth of stubble and roots resulting from such top dressing will ultimately give better results than will manure applied directly. The more efficient use of manure is therefore one of the ways in which some farmers can save money for fertilizer and increase their income.

Replacing the Herd.—Whether to raise cows or to buy them to replace the herd is a farm management question of considerable financial importance to individual farmers in the dairy regions. Obviously, from a regional standpoint, not all cows can be purchased. But since some regions always raise more than enough animals to replace their herds, some replacement by purchase is possible without decreasing the cow population. Cows of equally good production can always be purchased and transferred from the regions of cheaper conditions for less than the cost of raising them under expensive conditions. The average results for 884 New York farms indicated that the cost of raising heifers till two years of age was 123 per cent of their value at time of freshening and 104 per cent of the average value of all cows on these farms.

Persons who have given more attention to the husbandry than to the fiscal questions concerned sometimes assert that the only sure way to be a successful dairyman is to raise one's own cattle. The arguments for this contention that are usually advanced are: (1) certainty as to parentage of the cattle, (2) better disease prevention and control, (3) proper development and growth of animals, and (4) prevention of the risk of buying discarded cows. The often disregarded arguments against raising the cows are: (1) low production from young animals, (2) use of labor, pasture, and roughage that might more profitably go toward producing milk, and (3) cost of raising animals.

The average labor income on 14 farms in a region where A Grade milk and cash crops were produced that replaced all of the cows by purchase was $1585; on 16 farms that replaced some by purchase and some by raising, labor income was $1380, and on 21 farms that replaced entirely by raising $477. The difference in labor income is not due entirely to the method of replacement, but there is very little question but that some of it is due to the better production and the saving of expense on the farms replacing animals by purchases.

The activity of the cow market is influenced by price conditions for cash crops, as well as for milk. In regions where

crops are grown many cows are bought to replace herds. If the prices of hay, cabbage, potatoes, peas, and other crops are low, so that the income from crops is small, fewer cows are purchased, and with less willingness to bid up the price. When feed prices are high and milk low, as was the case this year, the same holds true. One of the things a dairyman replacing by purchase can do is to borrow if necessary in order to replace when cows are cheap, and thus possibly be able to sell some when cows are high, or at least escape replacing a large share of his dairy when the cow market is more active.

Use of Dairy Products on Farms.—Dairy farmers should use more of their own products. By drinking more milk, other food expenses can be reduced. Of course only a small proportion of the cows and calves turned off can be used for food at home, but most dairymen buy their meat at retail and sell their discards for little of nothing. From $15 to $40, depending on size and condition, is all that can be realized in New York State for cows fit for food. At retail prices one round steak for some families would cost nearly as much. Since a long time is required for one family to use an entire carcass, a round could be established in which several families would share a carcass, inspected if desired by a local official. Where milk is very cheap some calves could be fatted and used at home. In some regions meat is custom canned, and canning is equalizing the distribution on the farms just as the packers have done for the cities. Farmers should strive also to grow more of other food products, to avoid buying their living from a highly organized market. Selling the other fellow his living through an unorganized market is bad enough.

Credit.—Often the borrowing of money to purchase feed, fertilizer, or machinery so that supplies can be laid in when prices are low or cash discounts taken, is good business. In very hard times, however, the income from such credit purchases, which should be laid aside to pay back the money borrowed, is spent for necessities. Thus, credit in hard times sometimes encourages too intensive practices and difficult

financing. A safe plan is to borrow a minimum, making the business pay for the purchases as it goes, or to quit buying. The place to borrow is the place where credit is cheapest—the bank or private lenders. Many should be using cheaper credit than the expensive store credit now used.

Renting Dairy Farms.—Formerly, a common arrangement between landlord and tenant on share-dairy farms of the Northeast was for each to furnish half the productive stock, the landlord to furnish the farm and do the building repair work, and the tenant to furnish the horses and tools and their keep, and they then to divide the expenses and receipts equally. Very often the landlord paid the taxes and bought the grass seed. It is difficult to find tenants now who are financially able to do this, and further there is very little for the tenant in operating a straight dairy farm for half the proceeds. If the farm has other enterprises it then becomes more attractive. The landlord must now expect to furnish more than formerly because labor, living expenses, freight rates, and many materials (the things most felt by the tenant) are relatively high. Landlords frequently furnish all of the cattle, sometimes part or all of the tools, and occasionally to reliable men all of the personal property. As a further inducement, but rarely, two-thirds of the cash crops are given or sometimes part paid on the help hired. All sorts of arrangements and concessions are necessary to make the half-share system attractive to tenants, but for an owner who cannot give attention to the farm it is usually to be preferred to hiring.[4]

Changes in Size of Business.—In a poor year, when nearly everyone loses money, the farmers with the largest capital and the largest business suffer most. In 1921, in areas of less favorable price, New York farmers with over 30 cows lost more than those with less than 18. As the business increased the net income decreased. This would be expected with a speculative type like fruit farming, when frost destroys a crop, but to have it happen with a conservative type like

[4] Farmers who are sufficiently skilled so that they can command good city wages, and who are located so that they can live near or on the farms, may do well by renting their farms and getting some of the relatively high city wages, until city wages and farm costs lower.

dairying suggests great caution in expanding the business in times of price distortion. It is better to take it easy than to take a bump. The capital turnover on 215 New York dairy farms in 1921 was 30 per cent. It is now less, so that four years would be required for gross sales to equal capital. The turnover of feed stores was 249 per cent and of two milk companies 186 and 202 per cent.

Buying into the Business.—Cows, horses, and second-hand tools are cheap. The young farmer who is ready to start farming may not see a more favorable time to buy personal property. Land remains high in price, but good farms can be bought on long time at fair interest rates. If a young man can find a farmer so anxious to quit that a purchase can be arranged with a small payment down and very small principal payments, he is likely to make the grade. It is no time, however, to invest a considerable sum in so large a business that the remaining payments are likely to cause a risk of losing the investment. If one is of such age and has savings the loss of which would seriously discomfort his family but has not enough to be sure of holding a good-sized farm, he had better defer purchase. If he is young, and either has practically none, or has enough money to make the farm secure and expects to farm, it is a good time to buy. One can never say when or what is best for another, but today certainly is a time demanding very close calculation by everyone.

BOOK REVIEWS AND NOTICES

The Law of Diminishing Returns, by W. J. Spillman and Emil Lang. New York. World Book Company. 1924. Pp. xi +178.

This little volume to which Dr. Spillman has given the title "The Law of Diminishing Returns" is in two parts, the second consisting of Dr. Spillman's translation of Dr. Lang's article upon "The Course of Yield in Farming Expenditures" in the *Landwirtschaftliche Jahrbücher, Vol. LV, 1920,* and the first consisting of a contribution of Dr. Spillman's on the same general subject. The title chosen suggests economic subject-matter to most people. The principle of "diminishing returns" was first stated by economists and is very little mentioned in the literature of the natural sciences. The two articles, however, prove to have little economics, at least of the conventional sort, in them. They are essentially treatises in natural science. Dr. Lang's article is given the title "The Laws of the Soil" and concerns itself principally with presenting the results of the experimental work done with plants and soils by Mitscherlich at the Königsberg Experiment Station, and the preliminary work in the same field by other workers in Germany and elsewhere.

But this does not mean that the articles have little economic significance. On the contrary, they are of the highest order of economic significance. In the reviewer's opinion, the "trend of economics" in the present generation will be more and more toward including studies of this kind. The definition of economics which is coming to be used increasingly these days is Wicksteed's definition of it as a science of utilization of resources. Dr. Lang employs this definition (p. 174). Utilization has both a natural science aspect and an economic science aspect. No analysis of utilization is complete that does not combine a consideration of both the natural science aspects and the economic aspects. To illustrate in familiar terms, determining the input of feed that will give largest gain per hundred pounds of feed, and all the other conditions that go with this, is a natural science or "technological"

problem; but economical utilization requires that the prices of the feed, and of the livestock, and of the labor and all the other cost-elements, and of the product, be considered along with physical output per unit of input. (Lang states this very clearly on page 162, and Dr. Spillman on page 44 ff.) The economics of the present generation is going to be more useful than the economics of the past because it is going to start with the technological factors as a basis and tie the economic factors with these and bring out of this synthesis a practical working procedure.

It will, of course, not be the task of economics to develop the technological factors—this is the function of the natural sciences. One of the difficulties thus far has been that those working in the field of the natural sciences have not ordinarily presented their results in such a way that they can be utilized by the economist. They have not been thinking their results in terms of the economic factors with which they must be synthesized to give the final procedure for utilization.

This situation could not possibly be any better illustrated than by the case taken for study by Dr. Lang. Since Liebig first formulated it in 1839, soil chemists and plant chemists have been teaching the "law of the minimum." So far as the reviewer knows, they are still teaching it in most places. Liebig stated his law as follows: "The productivity of a field is in direct relation to the necessary constituent contained in the soil in smallest quantity." Now such a statement is obviously inconsistent with the principle of diminishing returns as ordinarily understood. In effect, it says that nothing which you do with any other of the soil constituents has anything to do with the effect of the one present "in smallest amount." It is even more obviously inconsistent with the whole marginal productivity theory of value so generally taken as a starting point in value theory to-day. All the years from 1839 to the present, the soil and plant chemists have struggled with this law of the minimum trying to reconcile it with the results of practical field experience. It has remained for Mitscherlich in a series of experiments, the first results of which were published in 1909, to resolve this difficulty by showing that Liebig's law of the minimum is wrong, and that the principle

of diminishing returns is the true principle involved. Perhaps the following statement of the new law, quoted by Lang from the Frenchman Mazé, is most useful for present purposes: "The magnitude of the yield is conditioned by *all* the factors of growth. Each single factor exercises the greater limiting influence on yield the nearer it is to the minimum" (p. 141). But even this does not tell the whole story—it does not provide properly for the mutual effect of the several factors upon each other. Mitscherlich demonstrated the importance of this in the case of two growth factors taken at a time. A German mathematician, Baule, in 1918 developed a formula for any number of varying growth factors which do not mutually affect each other. No procedure is developed for several interacting growth factors. Mitscherlich is not an economist. His interest in the problem is as a natural scientist. His reason for attacking the problem from the angle he did was apparently that common experience had attested to the truth of the economists' principle of diminishing returns, and that therefore some basis for it must be found in soil and plant science. It remained for Dr. Lang, an economist, to take up the work of Mitscherlich and the other workers in the field and present it from the point of view of economics.

Dr. Spillman's leading but by no means only interest in the problem is the shape of the curve of diminishing returns. The law of the minimum made the increase in yield proportional to the increase in the minimum factor—a straight line would express the results. Mitscherlich demonstrated that a logarithmically decreasing curve expresses the results, within the usual reaches of experience, with a surprising degree of exactness. This curve shows the yield increasing with each increment of fertilizer in proportion "to the amount by which the current yield fails of the maximum yield" (p. 104). Thus the nearer the yield to the maximum, the less the increase in yield with each increment of fertilizer. Dr. Spillman speaks of the increments in yield as "constituting the terms of a decreasing geometric series" (p. 111). As his associates have known for some time, Dr. Spillman, mulling over the same problem in 1920, stimulated to do so by some figures on fertilizers and cotton yields published in *The Country Gentleman*,

also conceived the idea of this same mathematical relationship, and proceeded to test it out upon all the data he could find. Presently, working through the literature of the subject, he came upon the work of Mitscherlich and this article by Dr. Lang. In his part of the book, he presents and analyzes all the data he has been able to secure in this country and then attempts to tie up the analysis with the economic factors involved.

Obviously it will be impossible in this review to take up much of a discussion of this phase of the problem. But it is of much importance. Mitscherlich says: "This physiological law thus aligns itself with all those physical and chemical natural laws relating to processes or reactions that gradually approach an end condition. These laws are all logarithmic in character" (p. 164). He might have included mechanical as well as natural processes, for many of these also "gradually approach an end condition." For example, the fixed inputs involved in using a tractor—i. e. power to propel it with no load, interest, fixed depreciation, etc., produce the same phenomenon of a gradual approach to an end condition. We are going to be greatly interested in the explanation in each case as to why the curve represents a decreasing geometric series. Undoubtedly the largest single factor in this is that as each new unit of the increasing input element is added, each unit of it has less of the other factors working with it, unless they also are increased at the same time. None of the fixed elements will be increased. This means in the case of land for example, that the sunlight, soil water, and the whole supply of plant foods already in the soil will be shared by a larger and larger number of units of the fertilizer being added—and having less of all these things to work with them, each will add less to the product. If all the growth factors could be increased at the same time and in the same proportion, the yield increases would describe a straight line. Increase all but one of them, and the result will be nearly a straight line. Increase only one of them, and the result will be a decreasing geometric curve with a high ratio, especially if the start is far from the maximum for this factor.

Where statistical data of sufficient accuracy can be obtained, the method of attack outlined in U. S. Department of Agriculture Bulletin No. 1277*, including the method of approximations for handling multiple curvilinear correlation as described in Mr. Ezekiel's article, "A Method of Handling Curvilinear Correlation for Any Number of Variables," in the December issue of the *Journal of the American Statistical Association*, should produce the same decreasing geometric curves, with the special and important advantage that the interactions of all the growth factors can be analyzed and stated, a thing not possible with Baule's formula. Neither Dr. Lang nor Dr. Spillman has seen fit to view this problem as lending itself to multiple correlation attack.

The important thing to say about this little book is that every agricultural economist should get it and study it. It won't do to talk about *reading* it—it must be *studied*. Part II should be taken before Part I, so as to get the historical background and the development of the problem. Perhaps a few suggestions can be made in conclusion that will help in this study:

1. The most careful statements of the principle of diminishing outputs distinguish between *additional* outputs, *total* outputs, and *average* output. By an *additional* output is meant an amount which is added to the *total* output as a result of adding a unit of the increasing element; and by *average* output is meant the output per unit of the increasing element—total output divided by the number of inputs of the increasing element. The principle can be stated in terms of any one of these. Dr. Spillman's "diminishing increments" are "diminishing total outputs," or amounts added to the total output.

2. The usual statement of the principle of diminishing outputs divides the phenomenon involved into three phases: first, a phase during which the additional outputs increase; second, a phase during which the additional outputs decrease, but total outputs increase; and third, a phase during which total outputs decrease. It is only the second or middle phase that Mitscherlich, Lang, and Spillman are considering. The de-

*"Input as Related to Output in Farm Organization and Cost of Production Studies." H. R. Tolley, J. D. Black, and M. J. B. Ezekiel.

creasing geometric series applies only to this phase. Mitscherlich admits the existence of the third phase, but disposes of it by saying that the decrease in total outputs sets in because new causes are beginning to operate. For example, in the case of fertilizer, the soil becomes toxic as too much fertilizer is applied. The first observation to make with respect to this is that from an economic standpoint, and hence from the standpoint of utilization, a decrease in total outputs is equally significant whether it proceeds from the same or a new cause. The second observation is that unless the decreasing increments are a purely mathematical phenomenon—growing out of nothing more than a ratio between the growth factors—there will probably be several reasons in most cases as to why the increments decrease, and some of these will be operating before total outputs begin to decrease as well as after. For example, as more seed is planted per acre, presently a point is reached where total output begins to decrease, and the factors causing this are mostly the same as caused the earlier decreases in the increments. The third observation is that theoretically, if the geometric curve is a true expression of the results for all possible inputs, only an infinite amount of the increasing element could cause a maximum yield to be attained, and long before this infinity was reached, surely some of the causes of the decrease in increments will have reached a magnitude sufficient to produce total diminishing outputs—again assuming other than a purely mathematical cause for the phenomenon.

As for the first phase of the phenomenon, the increasing increment phase, sometimes it is present in a practical way, but very frequently it is not. Where it is present, it will probably be for causes other than those producing the decreasing increments later. But they are significant in an economic sense regardless of cause. The principal reason why economists cannot always omit this first phase is that, when several elements in units of the sizes actually occurring in the world are combined in a production process, it may happen that some will be utilized somewhere in this first phase—especially on farms where serious mal-combinations occur.

3. Dr. Spillman states the law of "diminishing returns" in terms of "diminishing profits" per acre. This represents a confusion of terminology. Profits are a function of the size of the business and the capacity of the entrepreneur. Profits are profits to the entrepreneur. Profits to the entrepreneur do not begin decreasing at the point of highest average output per acre as Dr. Spillman states, or per laborer, or per unit of any other factor, but instead at the point where the last units of all of these just pay for themselves. The proper way to state the principle of diminishing returns as an economic principle is in terms of dollars of output and dollars of input.

4. There are at least three difficulties with Dr. Spillman's cost formula (p. 44 ff.). One is that variations in costs previous to harvest for things other than fertilizer—e. g., seedbed preparation, cultivation, spraying—also affect the yield. Second, variations in the plant foods already in the soil and consumed by this crop also affect the yield. Part of the rent charge against a crop represents a variable crop input, and part of it a fixed crop input. The first is definitely related to yield. Third, harvesting costs are far from being proportional to yield of grain, etc. Unit threshing costs, it is true, in any given area in a given year are the same for all yields, but they are not so over a period. Unit corn-picking costs are very far from being the same for all yields. As for the costs of cutting, shocking, and the like, they are as nearly proportional to area as to yield. A complete cost analysis that recognizes the relation of all these input elements to yield will take the form of the least-cost combination analysis presented in U. S. Department of Agriculture Bulletin No. 1277. Dr. Spillman over-simplifies his analysis by trying to put all the cost elements into the three categories, land, labor, and materials. What is needed instead is to go to the other extreme and recognize that different kinds of land, and man-labor, and capital goods—e. g., buildings, power machines, other machines, work stock, productive livestock, seed, fertilizer, etc.—behave differently in the production process, and to treat them accordingly.

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University of Minnesota.

RECENT PUBLICATIONS

Compiled by Mary G. Lacy, Librarian, Bureau of Agricultural Economics, U. S. Department of Agriculture

Agricultural co-operation in its application to the industry, the business, and the life of the farmer in the British Empire. With an introduction by Sir Horace Plunkett. London, G. Routledge & Sons, ltd., 1925.

This notable addition to the literature of agricultural co-operation contains (1) an introduction by Sir Horace Plunkett, (2) the report of the Conference on Agricultural Cooperation held at Wembley, July 28-31, 1924, and (3) a survey of agricultural co-operation in the Empire. Sir Horace Plunkett in his introduction explains at length the purpose of the Conference and its relation to the Horace Plunkett Foundation. He reviews the salient features of the outstanding addresses at the Conference.

The Survey of Agricultural Co-operation in the Empire, edited by Mr. Karl Walter, Secretary of the Conference, gives statistics and other data for co-operative organizations in England and Wales, Ireland, Scotland, Canada, Australia, New Zealand, South Africa, India, and the Crown Colonies.

FAULKNER, H. U. American economic history. New York and London, Harper & Brothers, 1924. (Harper's historical series, ed. by G. S. Ford.)

"We are now counting our resources, human and material, as we never did before . . . It is more necessary than ever before that we should study our national history from every standpoint and especially the economic . . . The author has given skillfully all the aid that any self-respecting student should require."

There is a good index and the Notes for Further Reference and the Selected Readings at the end of each chapter furnish valuable bibliographical material. The Selected Readings the author states "were chosen not alone for their excellence in throwing further light on the subject matter of the chapter, but also for their availability in the average library. In general they have been listed in the order of their value as supplementary reading, except that source books are always placed at the end." There are chapters of especial interest on colonial agriculture, agriculture from the close of the Revolution to the Civil War, the agrarian revolution, and recent economic tendencies.

GILBERT, A. W., ed. The food supply of New England. New York, Macmillan Company, 1924.

This book is the outcome of a conference held in Boston in January, 1923, called by the governors of the six New England states for the purpose of beginning a concerted study of the food question. According to the preface, "The conference set itself to take an inventory of the present situation and to lay out a ten-year program for New England agriculture. A summary of the

programs formulated by each commodity committee forms one chapter of this book. The work of the conference is now being actively carried on by a Continuance Committee, acting through a small executive committee. New England is one economic unit. It is logical that the various agencies of the six states should work together to solve the problem."

HIBBARD, B. H. A history of the public land policies. New York, The Macmillan Company, 1924. (Land economics series, ed. by R. T. Ely.)

This volume is the fourth of the Land Economics Series, edited by Dr. Richard T. Ely, Director of the Institute for Research in Land Economics. The author states that his aim has been "to put into one moderate-sized volume a sketch of the historical development and operations of our federal land policies." Practically all data are from original sources and the volume is a veritable mine of information on every phase of the subject. There is a chapter on the effects of the land policies on agriculture and another which reviews and criticises public land policies in the past and sets forth the need, even now, of a federal land policy which should comprehend the welfare of the entire nation.

KNOWLES, LILIAN C. A. The economic development of the British over-seas empire. London, G. Routledge & Sons, ltd., 1924.

Part 1 deals with the Empire as a whole and Part 2 with the tropics and sub-tropics. Part 3 of the work will appear later as Volume II and will deal with the economic histories of Canada, Australia, New Zealand, the Union of South Africa, and Rhodesia. To use the author's own words, "the first volume envisages the development of the primitive and mediaeval worlds within the British Empire and the second, the economic history of the modern nations of European origin." She writes also as follows: "If the British people are to understand the colonial point of view, and if they are faithfully to discharge their trust with regard to the millions of coloured races under their rule, it is essential that they should know something of the economic history of the various parts of the Empire. Practically all history in new countries is economic history, and people never move very far from their history in one generation. Tradition is very strong, changes are cumulative and usually slow. Forms of government may alter, but people do not take rapid jumps in economic matters. It is evolution, not revolution, that the economic historian chronicles." She proceeds to show the enormous and growing importance of the British tropics. "Leaving out India, they have in themselves become almost a new Empire within the last forty years, and it was borne in upon me that the race that controls the tropics will control the most important economic resources of the world in the coming century. Hence it is desirable for Englishmen to know something about the history of their tropical possessions."

MACKINTOSH, W. A. Agricultural co-operation in Western Canada. Kingston, Ontario, Queen's University, 1924.

This study is confined to the investigation of co-operative marketing and purchasing in the three provinces of Manitoba, Sas-

katchewan, and Alberta. Wheat pools are separately treated in an appendix and there is a bibliography.

PROKOPOVITCH, S. N. The economic condition of Soviet Russia. London, P. S. King, 1924.

The author states that he has used Soviet sources only and thinks that, in spite of the fact that the "Soviet regime recognizes no freedom of the press and no freedom of knowledge," it is possible to use such sources for an impartial account and a scientific analysis of the Russian national economy. He proceeds to show that there is a scanty Russian economic literature of recent years which tries to describe honestly what really happens. He enumerates this and documents his chapters very carefully.

SCHMIDT, L. B., and ROSS, E. D., ed. Readings in the economic history of American agriculture. New York, The Macmillan Company, 1925.

Brings together special studies of present-day writers rather than selections from the sources themselves. After the general introduction, which seems designed to show the fundamental significance of the economic history of agriculture, the work is divided into four parts: (1) Colonial foundations, (2) Plantation and frontier, (3) The Agrarian revolution and the settlement of the Far West, and (4) Reorganization and readjustment.

SMITH, J. RUSSELL. North America; its people and the resources, development, and prospects of the continent as an agricultural, industrial, and commercial area. New York, Harcourt, Brace and Company, 1925.

"North America is passing through a crisis in its economic history. The population of the United States increased twenty-seven fold in the one hundred and thirty years between the first census in 1790 and that of 1920. This increase, without parallel in the history of the world, was accompanied by the use, waste, and destruction of resources at a speed also unparalleled.

"That is past. What of the future? This is the concern of every intelligent citizen—a growing concern. It will be even more acutely an affair which the youth now being educated must face. Their education should give them a thorough knowledge of the continent on which they are to live. Hence this book." Pref.

U. S. DEPARTMENT OF AGRICULTURE.

Agricultural outlook for 1925. (Miscellaneous circular 38.)

Land settlement and colonization in the Great Lakes States, by J. D. Black and L. C. Gray. (Department bulletin 1295.)

Practical farm economics, by H. C. Taylor, H. R. Tolley, and J. W. Tapp. (Miscellaneous circular 32.)

NEWS NOTES

S. W. Mendum, Editor

Purdue

Two new farm management courses are being taught at Purdue University this year. One is called "Farm Business" and is a study of farm documents, deeds, contracts, mortgages, and rural law. The other course is a "Land Utilization Seminar" and considers land policies and the characteristics and classification of land.

Leo G. Hobson, Purdue '24, is pursuing graduate work in farm management and spending one-half time in the Station as an Assistant in Farm Management.

Charles M. Maddox, Purdue '24, is majoring in farm management while spending one-half time resident teaching as Assistant in Farm Management.

California

The Division of Rural Institutions of the University of California, in cooperation with the Bureau of Agricultural Economics of the U. S. D. A., is making a survey of the cooperative marketing organizations of California. In addition to obtaining general information about each organization, a study is being made of changes that have been made in organization or method of operation. Special emphasis is also being placed on the influence which methods of pooling have had upon the functioning of the organization and on the influence which type of organization and plan of operation have had on the financial policies of the various organizations. Most of the field work is being done by Mr. Harry R. Wellman and Mr. Carl A. Scholl under the direction of Professor H. E. Erdman. The work is to be completed by the summer of 1925.

Bureau of Agricultural Economics

A tentative bibliography of published and unpublished research in agricultural economics in the Middle Western States has been compiled by the Mid-West Agricultural Economics Research Council in cooperation with the United

States Bureau of Agricultural Economics. Copies may be had upon application to the Bureau of Agricultural Economics at Washington, D. C.

New Mexico

In a study recently made regarding the source of butter and eggs consumed in New Mexico cities of over 2000 population, it was found that only about one-fourth of these products were produced in the state. Kansas supplied nearly one-fourth of the butter and half of the eggs, and Colorado supplied nearly one-fourth of the butter. Texas and California were the two other principal sources of supply. Part of the imported butter, however, was made from cream which originated within the state.

Arkansas

On thirteen farms in various parts of Arkansas labor records were kept on all crops in 1923. These farms had about 570 acres of all crops or approximately 44 acres per farm. Estimates were made on the labor required for these crops on the basis of the labor standards printed in Department Bulletin 1181 and were compared with the actual records. The estimate of man labor for all these crops was 3012 whereas the actual record was 3157 or nearly five per cent above the estimate. Concerning horse labor, the estimate for all crops was 2629 horse days and the actual records showed 2637 horse days or within three-tenths of one per cent of the estimate.

Texas

The Department of Farm and Ranch Economics, Texas Agricultural College, has taken up the following projects:

1. A detailed study of farm records and accounts, the route to be located somewhere in the black land cotton belt.
2. A study of methods and economics of producing range livestock on Edwards Plateau.
3. An economic study of methods and cost of range cattle production in Texas.
4. A study of 20 typical local cotton markets in Texas.

In the first three of these projects the Federal Department of Agriculture is co-operating. The financial obligations are to be shared equally and in the local marketing study the Federal Bureau of Agricultural Economics bears the major part of the financial obligations.

In addition to the projects mentioned above two others have been in process for several months:

1. A study of farm mortgage financing in Texas by Dr. V. P. Lee, of the Department of Agricultural Economics, and
2. A study of the trend of land taxes in Texas and the proportion that land taxes bear to land income per acre. This study will probably be published in a series of small bulletins.

L. P. Gabbard, Chief of the Department of Farm and Ranch Economics, has general administrative charge of all the foregoing projects. In addition, Mr. Gabbard is completing his bulletin setting forth in much detail his recent survey of Rockwall County.

Oklahoma

The Farm Congress is an annual event sponsored by the Extension Division of the Oklahoma A. and M. College. In arranging the program this year the intention was to make it just as practical as possible. The speakers for the general sessions were selected from men who live in the Southwestern states. In addition, there were short course programs arranged by members of the faculty of the college.

An outstanding event of this year's congress was the organization of a state federation of boys and girls clubs. Oklahoma thus takes the lead in perfecting the first statewide federation. The 35,000 members of the boys and girls agricultural clubs in Oklahoma are now organized into a state association.

North Dakota

A bulletin delineating the agricultural regions of North Dakota prepared by the Department of Farm Management of the North Dakota Agricultural College is soon to be published. This bulletin carries about seventy maps and graphs

showing the production of various crops, damage factors, etc., by counties for each of the fifty-two counties of the state. This material is intended to be basic for the development of the extension program in the various counties and to assist in guiding further investigation work in the field. It is intended, also, to be of practical use to the thinking farmer.

Circular No. 61 of the Agricultural Extension Division of the North Dakota Agricultural College by T. S. Thorfinnson, Assistant State Agent in Farm Management, is off the press. This circular deals with "Some Applications of Farm Cost Accounts," showing graphically the relation of yield to cost, the relative income from various sources on the farm, and the relation of man and horse labor to income and cost.

The third year of farm business surveys of the range section of the State, of Jones County and of Brown County have recently been completed and are now being tabulated.

Kansas

The farm organization studies conducted by the Kansas Agricultural Experiment Station in cooperation with the Bureau of Agricultural Economics which have been conducted in McPherson County during the last five years have been terminated. Two bulletins dealing with this work have been published. One of them is Farmers' Bulletin 1440, entitled, "More Profit for the Wheat Farmers of Central Kansas," and the other is Department Bulletin 1296, entitled, "A Study of Farm Organization in Central Kansas." J. W. Tapp, of the Bureau of Agricultural Economics, assisted in the analysis of the materials and in the preparation of the manuscripts. R. D. Nichols, who has made the field studies in McPherson County, has been transferred to Bourbon County where another study of the same kind has been started. The prevailing type of agriculture in Bourbon County is dairying, while in McPherson County wheat production was the most important enterprise.

E. A. Stokdyk has been added to the staff of the department of agricultural economics at the Kansas State Agricultural College as associate professor. He will be in charge

of the marketing extension work in the state. Mr. Stokdyk is a graduate of the University of Wisconsin, with a Master's degree from the Kansas State Agricultural College.

Important tax measures have been enacted by the 1925 Kansas legislature. This is a direct result of the adoption at the 1924 election of an amendment to the constitution, permitting classification of intangible property and minerals for taxation.

A state income tax bill has also been introduced, but it stands practically no chance of enactment at this session. A measure providing for a production tax on oil and minerals has gained considerable favor, but its success is doubtful. It is probable that the legislature will authorize the governor to appoint a committee of three to make a study of tax revision in this state and to make recommendations to the next legislature.

This movement for tax revision in Kansas is partly due to efforts by the State Agricultural College in behalf of tax reform. Two bulletins on the subject have been issued by the Agricultural Experiment Station: Bulletin 232, "Assessment and Equalization of Farm and City Real Estate in Kansas"; and Bulletin 234, "Tax Revision in Kansas." Professor Eric Englund, of the Department of Agricultural Economics, is the author. In addition to these publications, a number of articles on tax revision have been issued by the college during the last two years.

Clemson

Farm management and cost surveys are being continued in five important farming sections. This work is leading up to record-keeping on some farms and it is planned eventually to make this the basis of extension projects and teaching programs.

Considerable data have been assembled on prices and price movements as a part of the general program to assist the farmer in his relationships to general economic conditions. This study is planned as a partial solution to the question of the best farm organization under different conditions, such as inflation or deflation.